THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
March 2, 1987 · Vol. XXI · No. 9 · $2/Copy · $44/Year

COMPUTERWORLD

INSIDE

In Depth — Managers learn to master change. **Page 51**

Iran scandal probe keyed into Profs message system. Page 2.

Hewlett-Packard offers lower cost laser printer and high-end departmental system. Page 4.

Issco users wooed by Computer Associates chief. Page 8.

Computer industry rallies around bill to move data base oversight away from military. Page 10.

DEC jumps on the publishing bandwagon. Page 92.

Galaxy from Lotus picks up where Jazz limped off. Page 29.

A little-known company's DB2 dictionary is in use at a New York investment bank. Page 19.

Travelers Corp. MIS sails to Ireland for software development and maintenance. Page 57.

Microsoft promises 286-DOS tool kit within six months. Page 6.

BULLETIN:
Datapoint Corp. Friday announced a 37% reduction in its U.S. work force, in addition to overseas cuts. Reporting a second-quarter loss of $65.8 million on revenue of $74.3 million, the firm said the severance of 786 employees, write-offs and reserves for products no longer deemed strategic will cost $56 million.

NCR builds 8-MIPS Unix Tower

BY ALAN ALPER
CW STAFF

NEW YORK — In a thrust into the mid-range of IBM's and Digital Equipment Corp.'s product line, NCR Corp. last week boosted its Tower family of multiuser Unix-based systems to performance well beyond traditional supermicrocomputer levels.

The Tower 32/800, which the company rated at about 8 million instructions per second, will be positioned against the IBM 9370 and DEC VAX 8300, according to Charles E. Exley Jr., chairman and president of NCR.

Like NCR's 9800 transaction processor, the Tower 32/800 system is based on multiple processors in a loosely coupled architecture.

Users can expand the system incrementally by adding plug-in processors to specifically handle application processing, file storage, terminals and printers, wide-area communications and local-area networks.

Under the modular architecture, segments of the Unix operating system are distributed to the specific processor responsible for that activity. This reduces system overhead on the applications processors and lowers system bus communications, NCR said.

The 32-bit system supports up to 64M bytes of main memory, 850M bytes of fixed-disk storage and 128 physical devices. In its largest configuration, the system offers a 14-fold performance increase over the entry-level Minitower, NCR said.

"At the same price point, the 32/800 delivers 1½ to two times the computing power of the 9370 — or conversely, the 9370 is 35% more expensive," noted

Continued on page 6

Data base makers rush to distribute

But path to speedy development is strewn with technical obstacles

BY ELISABETH HORWITT and CHARLES BABCOCK
CW STAFF

A wave of distributed data base product announcements is approaching as nearly every major data base vendor competes to exploit the potential of tying together data on disparate hardware systems.

However, many technical challenges remain before users will find themselves equipped with fully distributed capabilities, experts warn, and true data distribution is probably at least two years away.

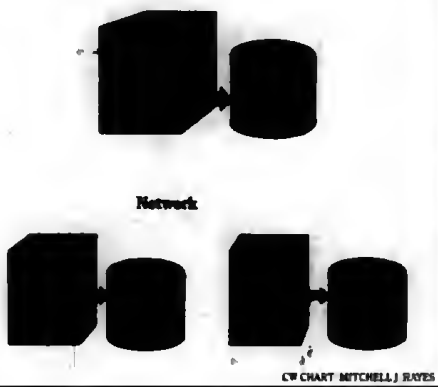
Theoretically, distributed data base technology permits processing to occur at a point close to where the data is being used. Once implemented, it could better employ the processing power on personal computers and, in some cases, on minicomputers without becoming divorced from the central data processing function.

Some software vendors, such as Cullinet Software, Inc., Oracle Corp. and Relational Technology, Inc., say they believe distributed data bases will provide the bridge to link IBM mainframes to Digital Equipment Corp. VAXs on factory floors and in departmental settings.

Computer Corporation of America has been developing a relational DBMS in Ada with distributed capabilities since 1985; Applied Data Research, Inc. expects to see its Datacom/DB on IBM 370 family of processors tied to a relational product on personal computers through an SQL interface; Software AG of North America, Inc. hopes to have a working prototype of its forthcoming distributed product, Adanet, by the end of this year; and Cincom Systems,

Continued on page 92

Future of distributed data bases



CW CHART MITCHELL J. HAYES

Few doing Windows

User, developer apathy plagues year-old interface

BY PEGGY WATT
CW STAFF

Little more than a year after Microsoft Corp.'s release of its Windows interface, as many as four out of five copies are still stuck in the evaluation room or shelved until applications appear.

Users and developers are at a standoff. Users say they will not adopt Windows until they have applications; software vendors say they want proof of Windows' acceptance before they plunge into development.

In addition, some vendors claim a love-hate relationship with the Windows concept and its proponents. They complain about pressure from Microsoft to develop for its pet project or say that writing to Windows is too difficult to be done quickly.

Even those in the industry who say they like the idea of a universal graphical interface are not certain the winner is Windows.

The result is a lull in Windows activity. Infocorp, a market research firm in Cupertino, Calif., estimates 85,000 to 100,000 copies of Windows are actually in users' hands. That is only 20% of the 500,000 copies Microsoft claims to have shipped, including OEM-licensed copies and runtime versions bundled with Windows applications.

"It's a catch-22," says Tim Bajarin, president of market research firm Creative Strategies Research International in San Jose, Calif. "Developers, including Microsoft, have to get the applications out. But a lot of developers tabled it.

Continued on page 14

Mac ripens as business alternative

BY PEGGY WATT
CW STAFF

LOS ANGELES — With today's scheduled introduction of two open-architecture models of the Macintosh that also read Microsoft Corp. MS-DOS and Unix files, Apple Computer, Inc. said it intends to finally deliver the hardware that backs the company's pitch of the Macintosh system as a viable corporate alternative to the IBM Personal Computer.

In a show of support for Apple's new "open Mac" policy, a host of third-party developers this week also are scheduled to announce software that takes advantage of the systems' new color and capabilities and add-on boards that were previously not

Continued on page 94

NEWSPAPER
5-DIGIT 48106
****
C
C4006970A-4
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

IN THIS ISSUE

Micro/mainframe office: DEC ties publishing on Vaxmate MS-DOS to VAX/VMS with VAX Integrated Publishing, and Computer Associates' Superimage, a graphics editor and drawing system for PCs, offers file transfer between micro and mainframe. **Pages 8, 92**

NEWS

4 IBM readies support of 4.5M byte/sec. channels for 3090 series.

4 HP delivers high-output, low-cost laser printer.

6 Microsoft developer's tool kit for 80286 MS-DOS ready soon.

8 Issco users warm up to firm's acquisition by Computer Associates.

8 Vendors fabricate 4M-bit dynamic RAM chips.

8 Symantec's Q&A 386 package optimized to run on 80386-based machines.

9 3Com proposes implementation of IEEE 802.3 standard.

9 3Com's 3+ network operating system features internetworking capability.

10 Users endorse bill to stop militarization of data security policy.

12 Potential IBM 9370 users can't see direction of departmental mini.

12 IBM speech-recognition system called 'impressive leap forward.'

12 DG announces support of E-mail standard.

13 Microport schedules April delivery for its version of Unix System V.3.

13 Aetna policyholders now able to access benefits data via PC-based system.

13 User organizatioo charges FCC order allows unauthorized access to customer information.

92 DEC's desktop-to-mainframe solution addresses publishing environment.

92 IBM forms marketing agreement with Sterling Software's financial group.

92 Louisiana judge tosses out shrink-wrap legislation.

94 Macintosh Ethernet and Unix networking products expected from Apple.

SOFTWARE & SERVICES

19 Concurrent provides processor users with remote, distributed facilities.

19 Start-up develops data dictionary for IBM's DB2.

MICROCOMPUTING

29 Forecast Master users say statistical software package aids understanding.

29 Renewed commitment to Macintosh spurs Lotus to offer Jazz successor.

NETWORKING

35 AT&T announces availability of IDSN terminals.

35 Gateway releases generic, high-speed LAN-to-LAN remote bridge.

35 Geographically distant Phonemail users can exchange voice messages.

35 Improved connectivity between Decnet and Netbios-based networks possible.

SYSTEMS & PERIPHERALS

41 Software house eagerly awaits enhanced IBM RT PC.

41 IBM unveils lower cost terminals, controllers for mid-range, large systems.

41 Masscomp adds support to low- and high-end scientific systems.

MANAGEMENT

57 Penney's uses DP, networking, cable television for home shopping service.

57 Managers not confident with own data security safeguards, survey finds.

57 Irish eyes are smiling as U.S. firms consider setting up operations overseas.

57 Users say they will increase information systems budgets.

COMPUTER INDUSTRY

67 Rodime patent infringemeot lawsuit meets with skepticism.

67 Telebit splits from DCA micro division.

67 Paperback Software asks court to dismiss suit.

67 Matsushita admits micros violate IBM BIOS chip copyright.

EMPLOYMENT TODAY

78 DP turnover spurned by technical challenge and career growth.

IN DEPTH

51 Mastering change: Have someone teach you the tricks of the trade.

OPINION & ANALYSIS

17 Wohl stands up for the marriage of Perot and Jobs.

29 Zachmann keeps an eye on Wyse.

41 Hamilton weighs the effects of Sun/Apollo debate.

57 Beeler ponders the lack of a DP ethics code.

67 Wilder calls 1987 the 'Year of the Lawyer.'

DEPARTMENTS

16 Editorial

65 Calendar

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), June (6 issues), July (5 issues), August (6 issues), September (5 issues), October (5 issues), November (6 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1987 by CW Communications/Inc All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/Inc for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.
Permission to photocopy does not extend to contributed articles followed by this symbol. ‡
Special requests for reprints and permission should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Subscription rates: $2.00 a copy; U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. Box 1016, Southeastern, PA 19398-9984.

NEWS

Profs system gave clues in probe of Iran scandal

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A mother lode of dozens of electronic mail messages from the National Security Council's (NSC) computer system proved crucial to the presidential commission investigation of the White House scandal over aid to Iran.

The Special Review Board sppointed by President Reagan, known as the Tower Commission, reported last week that the messages were sent on an IBM Professional Office System (Profs) running on an unspecified IBM mainframe. The system is run by the White House Communications Agency for the NSC.

"The Profs messages were conversations by computer, written st the time events occurred and presumed by the wrtters to be protected from disclosure. They provide s first-hand, contemporaneous account of events," the commission said.

"All NSC officers have personal passwords which enable them to send and receive messages to each other from terminals st their desks," the report said in s footnote.

IBM and White House offitcials contacted refused to fully describe the NSC system.

According to press reports last week, investigators alleged that NSC aide Lt. Col. Oliver North and his secretary, Fawn Hall, had shredded and altered the printouts of certain computer messages as part of s coverup. That effort was in vain, the press reports said, because originals were stored in s central computer archive.

The commission's report contains many verbatim passages from Profs messages, including exchanges among North, John M. Poindexter and former national security advisor Robert McFarlane.

The Tower Commission said it did not have evidence that documents were destroyed but did say that "the board found indications that Lt. Col. North was involved in an effort, over time, to conceal or withhold important information."

Society pulls out of NCC

ACM says withdrawl will help AFIPS

BY DAVID A. LUDLUM
CW STAFF

In an unexpected move, directors of the Association for Computing Machinery (ACM) voted to turn over the group's interest in the National Computer Conference (NCC) to the American Federation of Information Processing Societies (AFIPS).

In an unscheduled vote during a recent meeting, the directors of the ACM voted 15-to-4 to turn over the group's 15% interest in NCC to AFIPS, which manages the conference and owns half of it.

The NCC partnership agreement requires any share given up by an owner to be distributed among the other owners according to their shares; ACM directors said they hope the other owners will agree to give the ACM interest to AFIPS.

The agreement also states an exchange of ownership cannot take effect until the end of the fiscal year following the one in which notice is given, in this case, Sept. 30, 1988.

ACM will still indirectly help sponsor the annual conference, which will be held in Chicago in June this year, because it is one of the 11 organizations that make up AFIPS.

Adele Goldberg, the ACM director who proposed the move, said its purpose is to strengthen AFIPS by giving AFIPS the profits generated by ACM's share in NCC. Earnings from the conference, the chief source of income for AFIPS, have fallen in recent years as the show has drawn fewer sttendees and exhibitors.

Bryan Kocher, a Cambridge, Mass., consultant and the ACM council's Northeast regional representative, who voted against the move, said he felt the one good argument for it was that NCC may not be profitable in coming years and that ACM could lessen its share of any loss. However, the first show that ACM's withdrawal can affect is the one in 1989, and the conference could be returned to profitsbility by then, Kocher said.

ACM's share of NCC has not required the group to help finance the conference because NCC has been self-supporting, with earnings from one year's show funding the following year's and generating profit.

Rolland Arndt, chairman of the NCC board, called the ACM move "sort of a goodwill gesture" toward AFIPS and said it will not affect the conference..

The president of AFIPS, Jack Moshman of Moshman Associates, Inc. in Bethesda, Md., said the move, which surprised him, sppears positive.

TURBO

Why are SYBACK & SyncSort CMS the fastest things on no wheels?

(More technology in the tank!)

Call (201) 930-9700.

Arrange a test drive.



You say you've always had very simple tastes? All you ever wanted was the best?

Well, step into our showroom and kick a few tires! We'll show you two programs that are the Ferrari and Lamborghini of VM programs.

- **SYBACK – the world's fastest and most maneuverable backup, restore and copying program;**
- **Syncsort CMS – the world's fastest and most maneuverable VM/CMS sort program.**

What makes 'em so special? Well . . .

(1) TURBO PERFORMANCE: Have you ever stepped down on the gas in a dangerous driving situation and discovered . . . nothing? Well, that'll never happen to you with these two vehicles.

Both are equipped with our special brand of "software turbocharging." We call it FBT, which stands for Fluid Buffering Technique. Our competitors call it something else.

We discovered FBT one dark and rainy night when we were trying to find a way to speed up the movement of data in sort programs. After crying "Eureka," we applied it to our OS and DOS sort programs. The results were . . . wow!

Now we've carried that bright idea over into VM dump-restores and sort programs. And the results are still wow! Compared to any other backup or sort program clogging the nation's VM thruways today, SYBACK and SyncSort CMS will save you up to:

- **50% in Elapsed Time;**
- **45% in VTime;**
- **55% in TTime;**
- **75% in SIOs.**

So who needs all that speed? You do. If you want to optimize your VM operations, stay out of needless DP traffic jams, and make the boss happy with your throughput.

Here's what happened to one large government agency: Their backup operations used to require a full 24 hours to complete. Then they installed SYBACK. Now their backup takes — are you ready? — one-half hour!

(2) EASY HANDLING: SYBACK and SyncSort CMS are among the most flexible, user-friendly programs ever produced by anybody anywhere. That's one reason programmers love 'em. And where does it say that backup and sort operations have to be hard to be good?

(3) "MISTER SOFTWRENCH" SERVICE: We've got the best pit crew in the business. More than 85% of all customer requests are resolved within 24 hours.

If you'd like to put a little high technology in your VM tank, give us a call. We might even take your used VM dump-restore or sort program as a trade-in!

syncsort INC.

Syncsort Incorporated 50 Tice Boulevard, CN18, Woodcliff Lake, N.J. 07675

HP revamps Laserjet Plus, adds high-end unit

BY JEFFRY BEELER
CW STAFF

CUPERTINO, Calif. — Hewlett-Packard Co. is slated to introduce today a laser printer that provides better output quality and costs $1,500 less than the existing Laserjet Plus, according to company officials.

In addition to the desktop Series II, which connects to personal computer and workstation clusters, HP is also scheduled to formally announce the departmental Laserjet 2000. The 2000 is designed for departmental settings with output requirements as high as 70,000 pages per month. It works with mini- or supermini-class systems.

In a related move, HP also complemented the Series II with the announcement of a laser scanner. In a typical desktop publishing application, a paper document bearing a line drawing or other image is placed on Scanjet's flat-bed scanning surface and is scanned at a rate of 20 sec. per page. The picture is then reproduced on a PC's screen, where it can be reduced by up to 50% or enlarged by up to 200%.

Although HP will continue selling its Laserjet 500, reduced in price by $500, as well as the Laserjet Plus, both devices will go into retirement within six months. "Most customers no longer demand the kinds of functionality that those two products represent," said Steve Simpson, business manager for office printers at HP's Boise Division.

Laserjet days numbered

Since the two models first appeared in May 1984 and August 1985, respectively, more than 300,000 Laserjet units have found their way into user sites, according to HP estimates.

One enhancement on the Series II is increased storage. Although the Series II and Laserjet Plus run the same software and print at an identical rate — 8 page/min. — the former incorporates up to nine times more memory than the latter.

A standard Series II is configured with 512K bytes of random-access memory (RAM) and comes with an expansion slot that holds 1M to 4M bytes of memory.

At Security Pacific National Bank in Los Angeles, where a 2.5M-byte configuration of the Series II has been undergoing beta tests for a month, the device's edge in storage capacity has benefited the user's desktop publishing applications.

'Enormous' memory

"One of the advantages of having a desktop publishing system is the ability to beautify the pages of a document by changing fonts," said Security Pacific systems analyst Jean Harber. "But a laser printer needs an enormous amount of memory before it can be loaded with different fonts."

Expanded memory also doubles full-page graphics resolution to 300 dot/in., Simpson said. With the Laserjet Plus, by contrast, a full page of output produces a concentration of 150 dot/in.

Other Series II enhancements include:

- Fifty percent fewer moving parts and 30% lighter weight than the Laserjet Plus.
- A print cartridge that has a life of 4,000 pages, compared with 3,000 for its counterpart.
- The presence of two font cartridges, compared with just one on the Laserjet Plus.
- A front control panel that replaces the dual in-line pin switches that earlier Laserjet models used for configuring font types, page lengths, number of copies and other print variables.
- Support for 32 soft fonts, which can be downloaded from a PC's hard disk.

The Series II also comes with an optional I/O slot that can be used to support Imagen Corp.'s Document Description Language, which HP announced its intention to offer with its Laserjet line last August.

A basic Series II costs $2,495. The Laserjet 2000, which holds 1.5M to 5.5M bytes of RAM, starts at $19,995. When equipped with a factory-installed option that allows it to print on both sides of a sheet of paper, the 2000 sells for a minimum of $24,995. Scanjet sells for $1,495.

Shipments of all three products are scheduled to begin immediately.

IBM channel uprade expected soon

Competitive pressure from Amdahl, NAS may cause change

BY JEAN S. BOZMAN
CW STAFF

IBM is readying its support of 4.5M byte/sec. processor channels for the IBM 3090 series, according to industry analysts, who say they expect announcement of the feature within the next few months.

Analysts and users alike had expected the improvement in channel speeds — a 50% boost above the current 3M byte/sec. throughput rate — to be announced in the first quarter, but analysts say they believe IBM has pushed back the announcement because of software problems.

The higher channel speed, which users say IBM salesmen have hinted about for two years, is expected to be accompanied by the announcement of a new IBM 3880 disk controller with cache memory and possibly a new series of high-capacity disk drives, according to Dale Kutnick, executive vice-president of research at the Gartner Group, Inc. in Stamford, Conn.

The technical change, the first boost in channel speeds in several years, is also the stuff of competitive pressures, as IBM prepares to respond to Amdahl Corp. and National Advanced Systems, Inc. (NAS), its two plug-compatible mainframe rivals.

"It didn't happen as early as the industry expected because of some technical snags," says Bob Djurdjevic, president of Phoenix-based Annex Research, Inc. "But they're working on it now, and it should come out in the next several months."

Both Amdahl and NAS have announced channel speeds higher than 3M byte/sec. Amdahl announced a 4.5M byte/sec. channel speed in September that it said will ship this spring. NAS announced an effective 6M byte/sec. channel speed in early January, an option that it said will ship in April.

IBM ups bandwidth

IBM is expected to provide an implementation similar to Amdahl's, raising the channel speed by increasing the bandwidth of data transmission from 3 to 4.5 MHz. That differs from NAS's solution, which is to make the existing IBM-compatible channels bidirectional — raising the effective channel speed to 6M byte/sec. However, NAS did not elect to push the channel to 6 MHz.

Hitachi Ltd. engineers discovered that IBM was not implementing support for both buses on the mainframe channel, according to an NAS official. "What we discovered is a way in which we could send data down both buses at 3M byte/sec. and get the controller to receive data at 6M byte/sec.," says Minh Le, director of worldwide peripherals marketing for NAS.

IBM, Amdahl and NAS are all looking to higher channel speeds to help boost throughput and to reduce I/O bottlenecks. "A channel speed of 4.5M byte/sec. should raise throughput by 22% to 33%," says Don Feinstein, manager of storage systems marketing for Amdahl. A channel speed of 6M byte/sec. would double throughput, but achieving that speed by increasing the bandwidth of the channel to 6 MHz is not considered possible without fiber-optic channel technology, he adds.

And while both Amdahl's and NAS's solutions rely on solid-state disks to catch the higher flow of data, IBM is said to be relying on a large cache memory within the disk controller to act as the intermediary with standard rotating disk drives.

"The easiest way to implement a higher channel speed is to do it in such a way that users can continue to operate their current disk drives," says Jim Porter, editor of "Disk/Trend Report" in Los Altos, Calif. "Otherwise, making such a change would require users to buy new disk drives, new controllers and new channels — all at the same time."

An important consideration, Porter says, is that if the upgrade is easy to install, it will promote a ready cash flow from sales to end users.

But the higher speeds from Amdahl and NAS are linked to the use of special solid-state storage devices. For Amdahl's solution, users must buy a $320,000 Amdahl 6680 Electronic Direct Access Storage and a $20,000 Amdahl 6880 controller. The 4.5M byte/sec. channel speeds, priced at $25,000 per four channels, will be shipped sometime in the second quarter, Amdahl says.

NAS's higher channel speeds are limited to the simultaneous use of the $382,000 NAS 7900 solid-state device and $87,750 NAS 7970 controller. NAS provides the 6M byte/sec. channel option at no charge on the mainframe.

'Can't go that fast'

The solid-state peripherals must be used, Feinstein says, because the current generation of IBM and IBM-compatible rotating devices cannot keep up. "The rotating devices just can't go that fast," he says, "And there would also be synchronization problems with rotating devices to assure that the data arrived at the right time."

IBM curreotly does not offer any solid-state devices, which would mean that any increase in channel speed would probably be accompanied by the introduction of a disk controller with a large cache memory.

"We think that IBM will compensate for the lack of a solid-state device by doing more with cache memory," NAS's Le says.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Director
Peter Bartolik
Senior Editors
James Connolly, Systems
Clinton Wilder, Industry
Elisabeth Horwitt, Networking
Charles Babcock, Software
David Ludlum, Management
Douglas Barney, Microcomputing
Patricia Keefe, Networking
Senior Writers
Donna Raimondi, Rosemary Hamilton
Stanley Gibson, David Bright
Nimmimy Bubs Magnuss
Staff Writer
Alan J. Ryan
New Products Editor
Suzanne Weisel

Features Director
George Harrar
Senior Editors
Janet Fiderio
Glenn Rifkin
Joanne Kelleher
Associate Editors
Amy Sommerfeld Fiore
Deborah Fickling, Penny Jansen
Assistant Editor
Kelly Shea
Senior Writer
Michael L. Sullivan-Trainor
Researcher
Sally Cusack

Managing Editor
Donovan White
Chief Copy Editor
Patricia Heal Erickson
Assistant Chief Copy Editor
Steven M. Ulfelder
Copy Editors
Susan Miller, David W. Brumley
Mary Grover, Martha E. Ruch
Sharon Baker, Laura O'Connell
Marie T. Burke

Design Editor
Marjorie Magowan
Design Consultant
Kimn Campisi
Graphics Editor
Mitchell J. Hayes
Graphic Designer
P. Charles Ladouceur

Assistant to the Editor in Chief
Parth Domke
Editorial Assistants
Patricia Faherty, Christie Sears
Linda Gorgone, Bonnie MacKeil
Rights and Permissions Manager
Nancy Shannon

News Bureaus
Mid-Atlantic
201/967 1350
Alan Alper, Correspondent
Washington, D.C.
202/347-6718
Mitch Betts, Correspondent
West Coast
415/424-8844
Jeffry Beeler, Chief
Peggy Watt, Correspondent
James A. Martin, Correspondent
Midwest
312/827-4433
Jean Bozman, Correspondent

CW Communications International News Service
Susan Blakeney, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
617/879-0700

Computerworld is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes over 80 computer publications in more than 28 nations. Fourteen million people read one or more of the group's publications each month. Members of the CWCI group contribute to the CW International News Service offering the latest on domestic and international computer news. Members of the group include: ARGENTINA'S *Computerworld Argentina, PC Mundo*; ASIA'S *Computerworld Hong Kong, Computerworld SE Asia*; AUSTRALIA'S *Computerworld Australia, Communications World, Australian PC World, Australian Macworld*; AUSTRIA'S *Computerwelt Oesterreich*; BRAZIL'S *DataNews, PC Mundo, Micro Mundo*; CHILE'S *Informatica, Computacion Personal*; DENMARK'S *Computerworld Danmark, PC World Danmark*; FINLAND'S *Tietovikko, Mikro*; FRANCE'S *Le Monde Informatique, Distributique, InfoPC, LM Telecom*; GREECE'S *Micro and Computer Age*; HUNGARY'S *Computerworld/SZT, Mikrovilag, Taskonyv*; INDIA'S *Dataquest*; ISRAEL'S *People & Computers Weekly, People & Computers Monthly*; ITALY'S *Computerworld Italia*; JAPAN'S *Computerworld Japan, MEIKOS Computerworld Mexico*; THE NETHERLAND'S *Computerworld Netherlands, PC World Netherlands*; NEW ZEALAND'S *Computerworld New Zealand*; NORWAY'S *Computerworld Norge*; PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld, China Computerworld Monthly*; SAUDI ARABIA'S *Arabian Computer News*; SOUTH KOREA'S *Computerworld Korea, PC World Korea*; SPAIN'S *Computerworld Espana, Commodore World, PC World Espana, Communicaciones Informaticas Industria*; SWEDEN'S *Computersvarlden, Mikrodatorn, PC World*; SWITZERLAND'S *Computerwelt Schweiz*; UNITED KINGDOM'S *Computer News, DEC Today, ICL Today, PC Business World, Lotus UK*; UNITED STATES' *Amiga World, Boston Computer News, CD-Rom Review, Computerworld Computers in Science, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, inCider, InfoWorld, Mac World, Macro Marketworld, Network World, PC World, Portable Computer Review, Publish!, PC Resource, RUN, VENEZUELA'S Computerworld Venezuela*; WEST GERMANY'S *Computerwoche, PC Welt, Run Information Management, PC Woche*

Your business is unique. So where do you find the software to match?



Computer Corporation of America.

Trying to solve your particular information problems with off-the-shelf solutions can be devilishly difficult.

That's why Computer Corporation of America offers you a set of software tools with the flexibility and the power to let you create unique solutions at every stage of your information system.

CCA's software products provide you with unique new ways to experiment with database design and structure. We offer you the choice of a truly powerful fourth generation application environment or a COBOL program generator that allows you to develop, generate, test and run applications on a PC or mainframe.

Model 204, our DBMS, is the product of choice for those users who have large amounts of data and need to easily modify field attributes, dynamically increase field space, or smoothly migrate from one operating system to another.

If your problems lie in information retrieval or production reporting, CCA can provide a host of products that can retrieve data from Model 204 in text, statistical, graphic or even pictorial form. And we offer the country's easiest-to-use report generator designed to provide all the service you need while giving you complete control of production resources under CICS.

To help you get your entire organization sharing its information resources, we have networking software that uses your mainframe as the hub of a communications system that can tie your LANs, 3270 terminals, and word processors together.

CCA's products will boost your productivity. If you're not getting the flexibility and performance from the software you've been evaluating, perhaps you should at least look at ours. Just send for all the facts. Or call John Donnelly at 1-800-258-4100, ext. 701.

Please send me the complete story on CCA productivity software.
Mail to: Four Cambridge Center, Cambridge, MA 02142.

Name _____

Company _____

Title _____ Telephone _____

Address _____

City _____ State _____ Zip _____

Computer Corporation of America

A Computek Company

CW

New Dimensions in Software Productivity.

Tools for 286 DOS promised soon

Microsoft says package includes early DOS for developers, DP

BY DOUGLAS BARNEY
CW STAFF

REDMOND, Wash. — A developer's tool kit for the long-awaited version of MS-DOS designed for Intel Corp. 80286-based machines will be generally available to software developers and data processing shops within six months, Microsoft Corp. has announced.

The tool kit will contain a beta-test version of the operating system that will include the functionality of the final version but will not have the same level of performance and will not be bug free, according to Adrian King, director of operating systems for Microsoft. "It will be a complete set of development tools and a beta release of the systems software component," King said.

The tool kit will include debuggers, compilers, languages such as assembler and a C compiler that developers can use to create new applications. There will be other languages available for the operating system, but King would not disclose what those languages will be.

However, the final version of the operating system, dubbed 286 DOS, may be as much as a year away, and developers said they believe that major new applications will not start appearing until six to 12 months later.

According to King, a key advantage of the beta-test version of the operating system will be its ability to allow developers to begin testing applications. Final testing, however, cannot be done until the final version is released. "We are still in the stage of doing testing and performance tuning, so you would expect bugs to be eliminated and the product to get faster," King said.

Eagerly awaited

Developers last week welcomed the precursor to the long-awaited operating system, which has been in the works for 3½ years. "There are hundreds of companies that are anxious to get their hands on it," said Robert Carr, chief scientist for Ashton-Tate. "When Microsoft releases it, that is the starting gun [for developing applications]."

Without the tool kit, the wait for applications would be even longer. "This will enable applications developers to begin serious efforts on developing new applications for the protected-mode world," Microsoft's King said. Protected mode refers to the ability of applications to address up to 16M bytes of random-access memory on 80286 processors.

Unlike beta-test versions of the operating system, which are currently available only to a small number of software developers, the tool kit will be generally available and, as a result, will be distributed to interested data processing shops, according to King. "It will be a general release," he said.

"The one thing you won't be able to do with the developer's tool kit is go into your final testing period, but I think you will be able to use it for all your useful development work," Ashton-Tate's Carr said.

The liberal distribution of the tool kit will allow any interested software developer to exploit the operating system's capability and should lay to rest some of the criticism directed toward Microsoft's limited distribution of beta-test copies of the operating system.

King defended Microsoft's beta-test version distribution policy. "Although there are people working with versions of the product, those people have had to invest expensive development resources in helping us," he said. "They are working with very early versions of the code. There are bugs in it at that atage, there are aspects that we are changing. It is not as if they have been given something with which they can go and do serious work without being in a continual interchange of information with us and be prepared to take new releases at the drop of a hat."

According to King, the tool kit will provide all interested parties with the ability to compete in what will become a new market. "This general release to developers will be the first point at which we believe we have a product that is sufficiently full in terms of functionality and support that people can really begin serious work on applications."

One advantage of the wide availability of the tool kit will be input from developers. "I think that every developer should get their hands on the thing so we can find out if there are any real problems," said Daniel S. Bricklin, founder of the Software Garden and co-author of Visicalc, the original microcomputer spreadsheet program.

"The most significant thing about the developer's tool kit is that it is a publicly available release," Carr said.

Advanced DOS, bigger, more costly

BY PEGGY WATT
CW STAFF

Microsoft Corp. still will not give the final name or exact ship date of the next version of MS-DOS, but it tells of a bigger, more costly operating system that will only run on Intel Corp. 80286 and 80386-based microcomputers.



Bill Gates

In selected cases, however, users are said to have the ability to upgrade Intel 8088-based machines through the use of 80286 or 80386 expansion boards.

But machines need at least 2M bytes of random-access memory to run the operating system, which disqualifies some expansion boards, according to Microsoft Chairman Bill Gates.

The next MS-DOS, dubbed 286 DOS, will have 189 function calls, compared with 95 in current versions, and will handle those calls differently, according to Adrian King, director of operating systems.

Today, MS-DOS uses the software interrupt; in the future, it will have a set of subroutine calls, be said.

The new MS-DOS will take up some 700K bytes of memory, compared with the approximately 40K bytes used by the current MS-DOS 3.X line, King added.

The MS-DOS will contain some of the technology of the upcoming 80386 version, sources said.

Microsoft's systems software group is developing both concurrently, but the 80386 version will not ship until well after 286 DOS is in the hands of users, be added.

Microsoft Windows and network support will also be integrated into the next operating system, but will not necessarily always be bundled with it, Gates said.

The operating system's final configuration remains the decision of the hardware manufacturer who licenses it from Microsoft, be added.

NCR builds

FROM PAGE 1

Hugh Lynch, vice-president and general manager of NCR's General Purpose Systems Development and Production Division. "The same comparisons hold true of DEC."

Although not scheduled to be available in small configurations until the spring and in large configurations in the fall, approximately 40 sites have received some 80 beta-test units, NCR noted. About 20 customers are already using the system, including Chrysler Corp.

Unix dearth

Analysts last week said they were impressed with the ease of configurability and the power of the 32/800.

Many, however, said NCR would face an uphill battle against IBM and DEC in both the office and departmental processor markets because of what they termed a glaring lack of Unix application software.

However, NCR said approximately 700 applications packages currently run on Tower processors, of which approximately 25,000 have been shipped since the system's inception 4½ years ago. Software developed for the 32/400 and 32/600 will run on the new system, NCR said.

While older family members are not field-upgradable to the 32/800, they can work in conjunction with the new system via a LAN attachment, according to Van Aggelakos, director of product management engineering and manufacturing. NCR offers a variety of communications processors for the 32/800, a proprietary LAN and connections to IBM SNA and X.25 networks.

'Tough sell'

"In the office environment, companies tend to be loyal to existing software. It will be a tough sell for NCR," noted Chris Hallgren, an analyst with International Data Corp. in Framingham, Mass. "While they might bope to compete with DEC and IBM, where they probably will do well is against other Unix vendors."

Base-level pricing of the system is $87,000 and includes one application processor, one file processor, one terminal processor, 4M bytes of memory, 170M bytes of fixed-disk capacity, a streaming tape drive for backup and an operating system.

An expanded system priced at about $250,000 would include three application processors, two file processors, 12 terminal processors, 24M bytes of main memory, 850M bytes of disk, a streaming tape and an operating system.

Processor combinations

Up to five different types of plug-in processors can be incorporated in the 32/800 in a variety of combinations, including:

- An application processor handles user applications and non-I/O functions in the system.
- The file processor handles disk and tape I/O and features 1M byte of memory.
- A terminal processor handles all operations of printers and terminals attached to the system. Each terminal processor has 1M byte of memory.
- A communications processor handles all exchanges between the system and wide-area networks.

The 32/800 can communicate in local and remote networks. For non-Tower networks, interfaces to SNA and X.25 are offered.

Ethernet link

The LAN processor, featuring 1.25M bytes of memory, manages connection to an Ethernet Channel and runs Towernet systems software, according to the firm. Other LAN topologies such aa IBM Token-Ring will be supported in the future, the firm added.

NCR is offering a power backup unit with the 32/800. Using the unit, any power interruption of less than 10 seconds will not affect processing, while longer outages will result in a controlled system shutdown, according to NCR.

New systems tools offered with the 32/800 include Visual Administrator, a menu-driven systems administrator and Activity Analyzer, which provides status reports on system work load, utilization and problems.

NCR tower

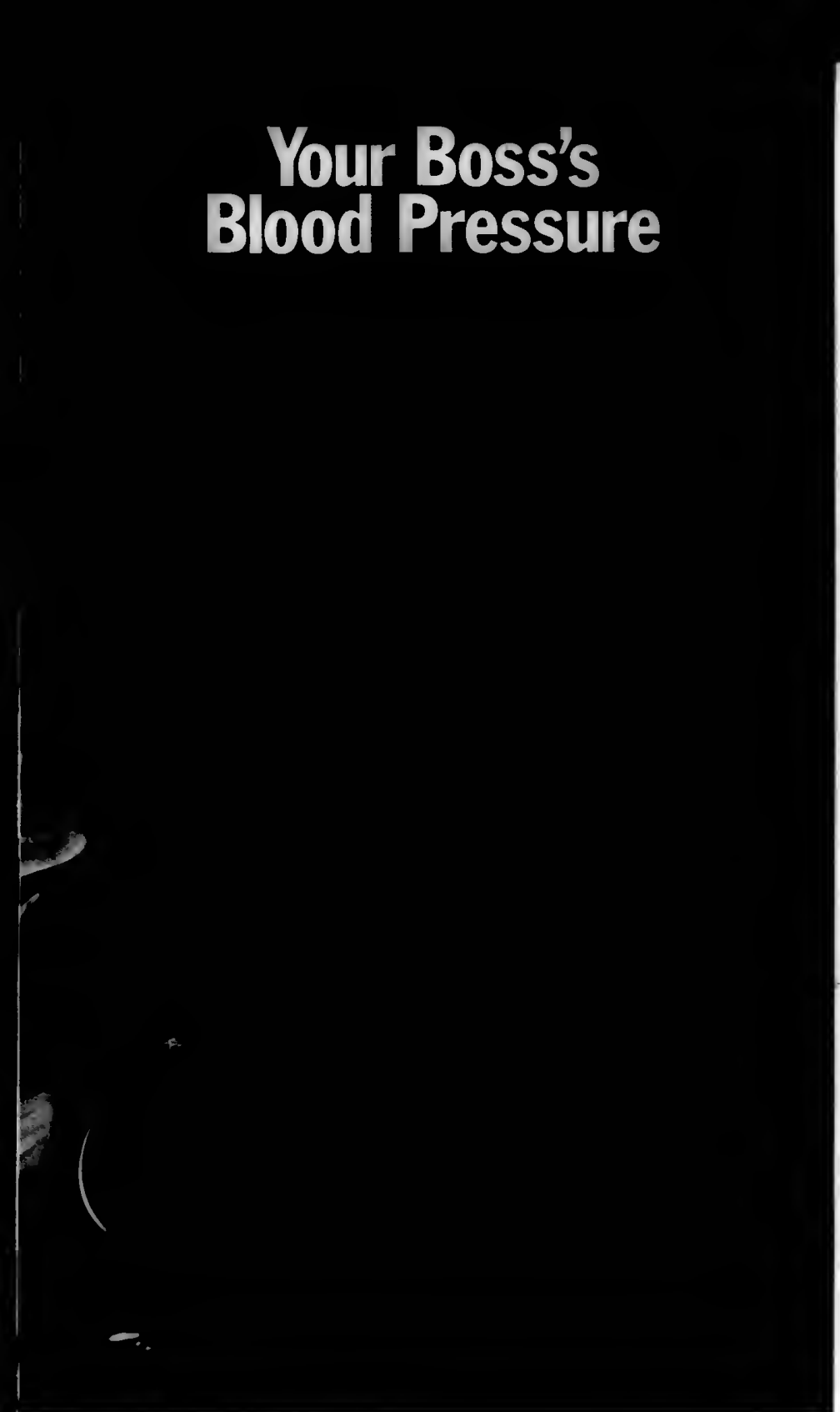
High-end addition to NCR's line

	Mini-tower	XP	32/400	32/600	*32/800*
Maximum Users	8	16	16	48	*128*
MIPS[1]	0.5	0.8	2.1	2.1	*8*
CPU[2]	68010	68010	68020	68020	*68020*
Memory Range (bytes)	1M-2M	1M-8M	1M-8M	1M-16M	*4M-64M*
Price (memory)	$9,450 (1M byte)	$12,870 (1M byte)	$14,995 (1M byte)	$27,170 (1M byte)	$127,000 *(4M bytes)*

1 Millions of instructions per second, based on CW estimates.
2 Motorola, Inc. microprocessors

CW CHART

Your Boss's Blood Pressure



Is there a better reason to buy VMCENTER?

Late reports. Security problems. Budget overruns. The color of your tie. There's a lot that can raise your boss's blood pressure. Yet for your sake as well as his, it pays to keep it down.

That's why it's so important to have VMCENTER on your side.

VMCENTER is the world's leading data center management system for the VM operating environment. It's a single, comprehensive package that can go a long way to keep things running smoothly—for yourself, for your boss, and for all your end users.

VMCENTER simplifies DASD management, resource scheduling, workload balancing, system accounting, and much more—all within a strong, flexible security framework.

The results: Better system performance. Improved user relations. Satisfied management. And tangible benefits on the bottom line.

Unique reporting system not only looks great, but actually works.

One thing bosses appreciate is initiative. As long it makes them look good. And few things make them look better than VMCENTER.

Through powerful reports, VMCENTER helps optimize resource utilization while eliminating potential trouble spots. Not just on paper, but in the real world of day-to-day operations. Which is exactly what management is all about.

It's enough to make the boss feel like taking it easy. Which is great for the boss—and even better for you. Because as it turns out, you're the one who needs VMCENTER the most.

After all, you're the one who has to see to it that the work gets done.

You're the one they'll yell at if there's a security problem.

And come to think of it, where *did* you get that tie?

VM Software, Inc., 1800 Alexander Bell Drive, Reston, Virginia 22091.

Subsidiaries: VM Software (UK) Ltd., Reading, Berks., UK, Telex 851848921; VM Software GmbH, Frankfurt, W. Germany, Telex 841411204.

VM Software
The VM Experts
800-562-7100
703-264-8000

1-CWX-670302

VM SOFTWARE INC.

Issco users breathe sigh of relief

BY JAMES A. MARTIN
CW STAFF

LOS ANGELES — The frosty reception by users of Integrated Software Systems Corp. (Issco) producta to that company's seemingly sudden acquisition two months ago has warmed considerably.

The 12th annual Issco users conference here last week drew some 700 users, many of whom were initially skeptical and uncertain of the San Diego-based company's future after being acquired by Computer Associates International, Inc.

There were, for example, concerns that the larger company would neglect Issco users and, even worse, take lightly that company's reputation and popularity for strong IBM mainframe graphics applications.

Soothing words

Although it is still too early to tell how the acquisition will ultimately be regarded, Computer Associates' actibns and words at the conference apparently eased some of those concerns for the present time.

In remarks at the conference opening, Computer Associates Chairman and Chief Executive Officer Charles Wang stressed the importance of Issco's graphics technology and said visual information packages will remain a major priority. Wang also promised that the Issco users conferences would continue meeting as usual.

In addition, Computer Associates announced Superimage, a graphics editor and drawing system developed by Issco for IBM Personal Computers and compatible machines.

Superimage is said to offer file transfer between a microcomputer and Issco's mainframe-based Tellagraf and Disspla graphics applications packages (see story this page).

'A lot of concerns'

"We had a lot of concerns initially," said Jeffrey Booker, systems



Charles Wang

consultant for the Southern Co. in Atlanta.

"We worried whether Computer Associates would continue to support both the user group and the quality of Issco's graphics," Booker continued. "I think Wang's presentation shows that they will continue to offer support and that they will integrate the two product lines as well, which could be a benefit to Issco users."

Wang's comments were also welcomed by Richard Dym, executive vice-president of Interchart Software, Inc. in Princeton, N.J.

"It was a relief to hear the commitment Computer Associates is making to the graphics producta," Dym said.

"We were worried that Computer Associates was interested only in Isaco's technology, but their commitment to the users seems genuine."

'Tap dancing'

The fact that Computer Associates is not "tap dancing around the issues" concerning Issco users was a relief to Bert Congdon, systems manager for Polaroid Corp. located in Cambridge, Mass.

However, Congdon said long-term questions of Computer Associates' direction and strategy regarding Issco products were still being pondered in many users' minds.

"Basically, I have a wait-and-see attitude," he added.

Firm folded in

Issco, which was acquired by Computer Associates for some $70 million in December, has been folded into the Garden City, N.Y., firm's Application Products Division in San Diego.

Computer Associates previously had a limited presence in mainframe and minicomputer applications.

However, the company spent about $100 million late last year to acquire both Issco and Software International Corp. and, in the process, build a stronger applications base.

"It's a very strategic move on our part," Wang said. "But to us, software is software. We don't see it as PC software or Digital Equipment Corp. software. We see it all connected in one way or another."

Computer Associates rolls out PC-host graphics link

BY JAMES A. MARTIN
CW STAFF

LOS ANGELES — Computer Associates International, Inc. announced a microcomputer-based graphics editor and drawing system last week that is said to offer file transfer between IBM Personal Computers and compatibles and Integrated Software Systems Corp.'s (Issco) mainframe graphics applications packages.

Superimage is the first in a multimodule graphics system for microcomputers developed by Issco, the San Diego mainframe graphics applications firm acquired in December by Computer Associates. The product was unveiled at the Issco users conference held here last week.

Available this month, Superimage is said to offer the functionality of Lotus Development Corp.'s Freelance program but "with the ability to transfer files between the microcomputer and the mainframe without leaving the system," the company said.

Superimage reportedly enables the user to transfer graphics and data files between the micro and the Tellagraf and Disspla mainframe packages without leaving the system.

The link is accomplished with a communications software utility that resides on the mainframe and is included in the Superimage package as well as a menu-driven interface on the micro software. Traditional micro-to-mainframe hardware links, such as coaxial cable and a terminal emulation card, are required.

With a Lotus-style user interface, Superimage will be positioned as a complement to Issco's Tellagraf mainframe graphics application package and as an add-on product to the Lotus 1-2-3 spreadsheet package. It will sell for $495.

Micro-mainframe link

The company also announced CA Planlinks, a micro-to-mainframe link that connects Computer Associates' Superproject Plus, a micro-based project management package, with Issco's Tellaplan project management software on mainframes and minicomputers.

CA Planlinks is said to give Superproject Plus users the ability to upload data to Tellaplan, which in turn can combine a variety of data into charts and diagrams.

Available for shipment in early summer, CA Planlinks will cost $99 per copy and will connect micro users to Tellaplan under IBM MVS/TSO and CMS/VM operating systems and Digital Equipment Corp. VAX systems.

Computer Associates also announced Version 4.21 of Megacalc, an IBM mainframe spreadsheet program that allows file sharing with Supercalc4, an integrated spreadsheet package for IBM Personal Computers.

The enhanced Megacalc is said to allow users to both upload and download all spreadsheet data, labels, formats and formulas. Available now, Megacalc 4.21 costs $7,800.

IBM, others show 4M-bit RAM chips; production use planned for next year

BY JAMES CONNOLLY
CW STAFF

NEW YORK — IBM and several other vendors drove past the 1M-bit memory level last week with announcements that they have fabricated high-speed, 4M-bit dynamic random-access memory (RAM) chips on existing production lines.

Engineers from companies including IBM, Mitsubishi Electric Corp. and Hitachi Ltd. described the design of CMOS chips at a New York semiconductor conference.

Meanwhile, Nippon Telegraph & Telephone Corp. (NTT) announced that it has developed circuit technologies and a prototype for a 16M-bit dynamic RAM chip providing four times the storage capabilities of IBM's chip. The Japanese communication company claimed its test device is composed of 40 million circuit elements on an



IBM's 4M-bit chip, *pictured with tip of fountain pen*

8.9mm by 16.6mm chip substrate with an I/O speed of 80 nsec.

The developments were announced through technical papers presented at the Institute of Electrical and Electronics Engineers, Inc. International Solid-State Circuits Conference.

IBM said its 4M-bit dynamic RAM was developed by engineers at its Yorktown Heights, N.Y., and Essex Junction, Vt., semiconductor facilities and fabricated on the Essex Junction production lines.

IBM engineer Richard Parent reported that the chip occupies an area of silicon 35% larger, at 78 sq mm, than IBM's existing 1M-bit chip while storing four times as much data. Parent claimed the chip has an access time of 65 nsec, compared with the 80 nsec access time of the current 1M-bit chips used in products such as the IBM 3090 mainframes.

The chip is IBM's first CMOS-based dynamic RAM. Earlier chips used N-type metal oxide semiconductor (NMOS) technology. The CMOS chip operates on a 3.3-volt power supply, compared with a 5- volt supply in NMOS technology.

One analyst reported that the 4M-bit chips are likely to appear in finished products late next year. "We expect samples to start coming out in the first part of 1988, but we don't expect any real production to begin until late 1988," said Victor de Dios, senior industry analyst for Dataquest, Inc., a San Jose, Calif.-based market research firm.

De Dios said 1988 deliveries would keep IBM and other vendors on what has proven to be a three-year cycle. IBM announced it had fabricated its 1M-bit chip in April 1984, installed those chips in its 3090 mainframes two years later and announced the 4M-bit chip at the end of the three-year cycle.

He said be expects the three-year cycle to continue with 16M-bit chips.

Q&A to tap 386 power

Symantec Corp. early this month is expected to announce Q&A 386, a version of its data base and word processing package optimized to run on Intel Corp. 80386-based machines.

"This is not the be-all and end-all, but it is an optimized 80386 version," a Symantec source said.

The package, expected to sell for as much as $495, takes advantage of the Intel Above Board memory board and the Lotus/Intel/Microsoft Expanded Memory Specification. This allows users to address up to 3.5M bytes of expanded random-access memory. Q&A does not currenty utilize extended memory. While the package, which is slated to ship in May, is upwardly compatible with the current version, it will only run on 80386-based machines.

3Com seeks twisted-pair Ethernet standard

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. last week said it is developing technology to deliver IEEE 802.3-standard 10M bit/sec. Ethernet over unshielded twisted-pair wiring and plans to push it as an international standard.

As interest in this area builds, other vendors are expected to announce similar plans. Leading the pack is AT&T, which two weeks ago announced it had signed an agreement with Synoptics Communications, formerly Astranet, to develop an 802.3 implementation in a star topology running at 10M bit/sec. on AT&T's Premises Distribution System.

No standard exists today for implementing the 802.3 protocols over twisted-pair wire. But 3Com officials revealed plans to submit design specifications to the IEEE 802.3 standards committee for consideration.

Incompatible standards?

Acknowledging that 3Com's proposal might not be accepted as the standard, 3Com Chairman and Ethernet co-inventor Robert Metcalfe said that nonetheless, he would be disappointed if multiple, incompatible implementations of 802.3 on twisted pair emerged.

3Com appears to be spearheading a drive to create a single standard — its own or another. "We've talked with some people in the industry about a standard [twisted-pair Ethernet], and we all agree we should go to a standards committee [with this issue]," said Reinier Tuinzing, 3Com's manager of transmission products.

He attributed 3Com's decision to issue a "statement of direction" about its efforts in this area to pressure from customers seeking to exploit their installed bases of twisted-pair wiring.

The benefit to twisted-pair Ethernet lies mainly in reducing wiring costs by alleviating the need to pull coaxial cable throughout a building. Ethernet is available today in broadband and baseband, or coaxial, implementations, both of which require special cable.

"There is a big demand for [twisted-pair Ethernet], especially in places like New York City, where buildings are so jammed with wire, there isn't room to pull new cabling, even if you wanted to," Tuinzing said. The cost savings realized from using existing telephone wire should enable many users to link even more desktop systems to their networks.

The disadvantages include distance limitations and degradation from noise as unshielded twisted pair is more likely to radiate and be susceptible to radio-frequency emissions.

Target users of Ethernet over twisted-pair wires are considered to fall into two groups: scientific or engineering users who want to migrate Ethernet to their office systems; and users who may want 10M bit/sec. speed but are wedded to using twisted-pair cable for networking.

3Com is targeting this summer for the release of its product. 3Com's hardware-only approach should allow a standard Ethernet controller to be connected to personal computer networks utilizing 3Com's 3+ network software while running over unshielded twisted pair.

Bridge to Netbios in 3+ Upgrade

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. has enhanced its 3+ network operating system with internetworking capability for IBM Netbios-based software.

Users of Netbios applications on 3Com's Ethernet and 3Com or IBM's Token-Ring can now share data and resources transparently through remote modems or internetwork bridges, 3Com said. This reportedly eliminates the need for costly and separate gateways on each network.

Network applications for IBM Personal Computers and compatibles are written to either DOS or Netbios. 3Com already provides internetworking for DOS-based applications. Netbios is a standard interface that allows applications more control over message transmission but does not feature internetworking.

Available at the end of this month, Version 1.2 of 3+ integrates Netbios into its Xerox Networking Standard (XNS) communications drivers to provide internetworking, the vendor said.

Version 1.2 also provides users with access to network applications that previously would not run under 3+. These packages include IBM's Asynch Server, PC Network Program and PC 3270 Emulation Program; Hayes Microcomputer Products, Inc.'s Smartcom II; and Digital Communications Associates, Inc.'s Crosstalk XVI and Irmalan, among others.

Suggested list price for 3+ 1.2 is $1,059 for a one- to five-user network. The cost for an unlimited number of users of either PC Servers or 3com's 3server is $2,100. An upgrade path will be provided for current 3+ users.

How to become the outstanding CICS programmer in your COBOL shop for $50...or less!



To be an outstanding CICS programmer, you have to write programs that (1) are done in a fraction of the time it would take another CICS programmer to develop them...(2) are easy to maintain when user requirements change...(3) are so reliable they cost next to nothing in terms of "fixing" once they're in production... and (4) run more efficiently than 90% of the other CICS programs in your shop.

If you're ready to learn how to create programs like these, we've got the course for you. It's called *CICS for the COBOL Programmer*, and it comes in 2 parts. You can choose either or both, depending on your current level of CICS skill.

What Part 1 does

Part 1: An Introductory Course covers the basic command-level elements you'll need in every CICS program you write. So you'll learn how to: create and use basic mapping support (BMS) mapsets ...write pseudo-conversational programs ...use CICS commands for terminal handling, VSAM file handling, and program control...design a CICS program so it's easier to code, test, debug, and maintain ...debug CICS abends using either the Execution Diagnostics Facility (EDF) or a storage dump...and more!

What Part 2 does

Part 2: An Advanced Course covers the CICS elements you'll use regularly, though you won't need them all in every program. You'll learn how to: use browse commands, temporary storage queues, and transient data queues...apply DL/I data base processing to CICS programming...use interval control commands to start a task...produce multi-page output using BMS page building ...and more!

Why these books will make you an outstanding CICS programmer

When you read about CICS courses and what they cover, they may sound pretty much the same. So why do I say this course will offer you the expertise that others don't? There are 3 main reasons:

1. Program design None of the other CICS courses I've seen spends much time talking about program design. But these books show you how to break your CICS programs down into functional modules that are manageable when it comes to coding...and that make it easier to pinpoint errors during testing. What's more, if you use this design method, you can lift whole chunks of the design (and the resulting code) from one program to use in the next.

That means you'll be able to design and code programs faster, because you won't start each program from scratch. And you'll be able to debug them faster, because half of the code will come from other programs that have already been tested and debugged.

2. Examples To make it easier for you to master the complexities of CICS, these books are chock-full of examples...from syntax summaries for CICS commands to schematic illustrations that show how various CICS elements work. But more important, these books give you complete design and code for 16 CICS programs (5 in *Part 1* and 11 in *Part 2*).

Examples like these will help you in 2 ways. First, when you're reading the texts, they'll help you understand the CICS elements you're learning about. Second—and this relates to what I said about design—you'll be able to use the examples as models when you're writing your own programs. So you'll be able to show what a topnotch CICS programmer you are from the very first program you write.

3. How to use CICS well One reason CICS is complex in terms of programming is that there are often half a dozen CICS facilities you could use to solve a given problem. So to be an outstandiog CICS programmer, you need a broad understanding of what facilities are available, how they're used, and how they interact. Then, you can choose the best solution for the problem at hand.

This course, particularly the *Part 2* text, is designed to give you that kind of understanding. As a result, you won't just learn the syntax of CICS commands ...you'll also learn what's going on when a given command executes so you can make your programs as efficient as possible.

No-risk guarantee

So there's no risk to you, *CICS for the COBOL Programmer* comes with my unlimited guarantee. These books must help you become the outstanding CICS programmer in your COBOL shop, or send them back for a full refund...*no time limit*. But first, try them FREE for 30 days.

Mike Murach & Associates, Inc., 4697 West Jacquelyn, Fresno, CA 93722 • (209) 275-3335

To order by phone, call 1-800-221-5528
(Weekdays, 9 to 4 Pacific Std. Time)
In California, call 1-800-221-5527
Please mention this ad code: C4/2

Mike Murach & Associates, Inc., 4697 West Jacquelyn, Fresno, CA 93722

YES, Mike, I want to master CICS. Please send me the items I've indicated below. I must be satisfied, or I'll send them back at any time for a full refund, no questions asked.

____ **CICS for the COBOL Programmer, Part 1,** 326 pages, $25
____ **CICS for the COBOL Programmer, Part 2,** 322 pages, $25
____ **CICS Instructor's Guide,** 5 tabbed sections in a 3-ring binder with lab problems, tests, and transparency masters for both texts, 421 pages, $75

☐ Bill me for the books plus UPS shipping and handling (and sales tax in California)
☐ I want to **SAVE** shipping and handling charges. Here's my check or money order for full payment. Calif. residents, please add 6% sales tax to your total. (Offer valid in U.S.)

Name & Title _____
Company (if any) _____
Address _____
City, State, Zip _____ C4/2

Move afoot to scuttle data base oversight

Groups endorse transferring authority of data from NSA to NBS

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Diverse segments of the computer community last week endorsed the transfer of authority of nondefense computer security programs from the National Security Agency (NSA) to the National Bureau of Standards (NBS).

Legislation sponsored by U.S. Rep. Jack Brooks (D-Texas) would, if enacted, have the practical effect of overturning the controversial National Security Decision Directive 145 (NSDD 145), which placed the NSA and the Department of Defense in charge of data security for all federal agencies and of assisting the private sector with security standards and information.

At a two-day hearing chaired by Brooks, critics of NSDD 145 said the change is necessary to prevent the militarization of information policy. Witnesses noted that the military's tendency is to overcontrol information.

Supporters of the bill's general intent included the Computer and Communications Industry Association, the American Bankers Association, Electronic Data Systems Corp., Software AG of North America, Inc., the Information Industry Association, the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and the American Library Association.

Witnesses from the private sector concluded that the NBS should assist computer security efforts at nondefense agencies and should develop standards with the private sector, while the NSA should handle only the defense community. "We favor a clean division of responsibilities," said John M. Richardson, spokesman for the IEEE.

Cheryl W. Helsing, testifying for the American Bankers Association's data security committee, said the business community is more comfortable dealing with the NBS, which is part of the Department of Commerce. She claimed the NBS understands the private sector's need for cost-effective security, whereas the NSA tends to favor high-level security fixes regardless of cost.

An important feature of Brooks' bill — entitled the Computer Security Act of 1987 — is the establishment of an advisory board that would include private-sector computer security experts, added Helsing, vice-president of corporate security for the Bank of America in San Francisco.

NSDD 145, signed by President Reagan in 1984, created a new category of information called "sensitive but unclassified" information that should be protected from foreign spies, terrorists and criminals.

The controversy heated up last November when that sensitive category was given a broader definition covering technical, economic and personal data and when Pentagon officials said they would place unspecified controls on commercial electronic information services [CW, Nov. 17 and 24].

Donald C. Latham, an assistant secretary of defense, and Lt. Gen. William E. Odom, director of NSA, defended the NSDD 145 program and opposed Brooks' bill, although they hinted at possible compromises to increase the role of NBS.

Top-notch technical expertise

Odom said his agency's National Computer Security Center has developed top-notch technical expertise, and he argued against splitting the standards-setting process between civilian and military agencies. Latham asserted that much of the criticism is based on misunderstandings, and he stressed that the civilian agencies have a major role in policy formation.

Critics at the Brooks hearing faulted NSDD 145 on grounds that it was developed in secrecy and gives military agencies too much control over computer security policies.

"Unless halted, this militarization of the information process threatens the free flow of public information, scientific inquiry, competitiveness of the information industry and open government," testified Jerry J. Berman, chief legislative counsel for the American Civil Liberties Union [CW, Jan. 12].

A contradiction in terms

Several critics stated that the concept of "sensitive but unclassified" information is faulty and perhaps a contradiction in terms. Rep. Glenn English (D-Okla.) noted that information is either sensitive national security information that ought to be classified and well protected, or it is not.

English commented that NSDD 145 appears to be based on the so-called "mosaic theory," which holds that the combination of unclassified data elements can permit the deduction of classified information.

Carried to its logical conclusion, however, the theory would justify the censorship of virtually all information that adversaries could use.

Introducing MICOM's enhanced wideband stat mux.

How to get six times the mux for your bucks.



Think of an enhanced wideband stat mux as a very large funnel. It lowers your transmission costs by funneling data six times faster than most conventional multiplexors. You'll use higher speed lines. And use them more efficiently.

A Ferrari with a Model T engine.

That's what your network is like if you don't allow it to transmit data as fast as its technology permits. The MICOM® BOX Type 3, an enhanced wideband multiplexor, helps data network managers lower leased line costs by transmitting data at speeds from 56 to 72 Kbps. So it's the perfect solution for keeping line costs down and accommodating an increasing volume of secured data traffic.

Sixteen separate async 9600 bps lines can be compressed into one 56 Kbps line—a 75% cost saving. For high speed/high volume applications, each channel can be preset to support speeds up to 19.2 Kbps with automatic baud rate detection.

But that's just the beginning. Data traveling between muxes is error free. Satellite link support is standard for integration into sophisticated networks. A built-in command facility can be used to configure, monitor, and test your entire network from any async terminal. Finally, our enhanced wideband stat mux is compatible in a multihost environment —including DEC, HP, DG, Wang, Tandem, and other popular systems.

The perfect multiplexor for applications like CAD/CAM and graphics. And any other high-volume data application such as file transfer or host-to-host transfer.

Of course, you also get our exclusive applications hotline. Call us now for applications assistance, or to talk things over with a knowledgeable, friendly voice.

The phone call is free. The advice could be invaluable.

Now you can take advantage of high speed phone lines that didn't exist just a few years ago. Economically.

1-800-MICOM-US

MICOM Systems, Inc., 4100 Los Angeles Avenue, Simi Valley, CA 93062-8100.
Europe: UK-(44) (635) 832441.
Int'l: USA-(01) (805) 583-8600.
"MICOM" and "MICOM BOX"®

More ways to help computers do more.

GET HALF-A-COMPUTER FREE WITH ORACLE VERSION 5



With ORACLE version 5, you save half the computer you thought you needed in order to "go relational"... some benchmarks indicate you save even more.

WHY IS VERSION 5 OF ORACLE SO FAST ON MAINFRAMES, ON MINIS AND ON MICROS?

□ REASON #1: AI OPTIMIZES QUERY PROCESSING.

V5 applies artificial intelligence to SQL query optimization. For example, few DBMSs can optimize the query "Select accounts 90-days overdue and accounts over $10,000." But only ORACLE can optimize "Select accounts 90-days overdue or accounts over $10,000."

□ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with **logical** sets of data. But they manipulated only one **physical** record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

□ REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

□ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

□ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

□ REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPUT.

Row-level locking and a read-consistency model optimizes ORACLE V5 transaction concurrency. For the first time, high transaction thruput is achieved by a fully relational DBMS.

THE ULTIMATE REASON

Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979. Today ORACLE is installed on thousands of minis and mainframes, and over ten-thousand PCs. ORACLE is the only SQL-*compatible* relational DBMS that's *portable* across IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. And ORACLE applications and databases are *connectable* across different hardware and operating system, providing you with a true distributed solution to your information needs.

Spend half a day at an Oracle seminar in your city, and find out how you can have the benefits of a portable, DB2-compatible relational DBMS... and save half a computer. Call our national seminar coordinator at 1-800-345-DBMS. Or write Oracle Corporation, Dept. V5, 20 Davis Drive, Belmont, CA 94002.



ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Call (800) 345-DBMS today.

Ottawa (613) 238-2381 □ Quebec (514) 337-0755 □ Toronto (416) 362-3275
ORACLE-U.K. (SURREY) 44-1-948-6976 □ ORACLE-EUROPE (NAARDEN, THE NETHERLANDS) 31-2159-49344

©1986 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. SQL/DS, DB2 and IBM are registered trademarks of IBM. DEC, DG, AT&T, Stratus, HP and Bell Laboratories own numerous registered trademarks. TRBA.

Mid-range buyers trip on IBM strategy

BY STANLEY GIBSON
CW STAFF

ANALYSIS

NEW YORK — Despite IBM's recent statements of strategic direction regarding its mid-range products, some potential buyers of the new 9370 departmental minicomputer say they still see no clear path to follow.

One such potential customer, who has been looking at the 9370 as a building block for a nationwide network of automobile dealers, said he will not be able to use the 9370 unless an asynchronous interface is offered. But he said IBM has given him no assurance that this would be forthcoming.

Another prospective 9370 buyer said that, having made a decision to purchase Digital Equipment Corp. machines as departmental processors, he is delaying the acquisition in order to examine the 9370. Although he expressed doubt about selecting the 9370 due to a lack of application software available now, he said his senior management, committed to buying from IBM, is requesting consideration of the departmental processor.

The users' comments came at an IBM conference here that was sponsored by The Yankee Group, a Boston-based research firm.

IBM needs to clearly state a direction for intermediate systems, said Thomas Henkel, a Yankee Group industry analyst. "There's more doubt after the mid-range announcement than there was before," he said, alluding to IBM's recent statement of equal reliance on System/36 and 38 and 9370 architectures.

"The 9370 is an extremely mysterious product for users and for the entire industry," offered George Colony, an analyst with Forrester Research, Inc., based in Cambridge, Mass.

Henkel said he believes the System/36 and 38 machines will take a backseat to the 9370 as departmental processors despite IBM's statement of equal emphasis on both.

But despite the 9370's strategic importance, its utility to users hinges on connectivity features that will tie it into their corporatewide systems. One potential customer offered that the 9370 would not be valuable to him until an application-to-application IBM VM 9370-to-IBM MVS host connection is possible.

A long way to go?

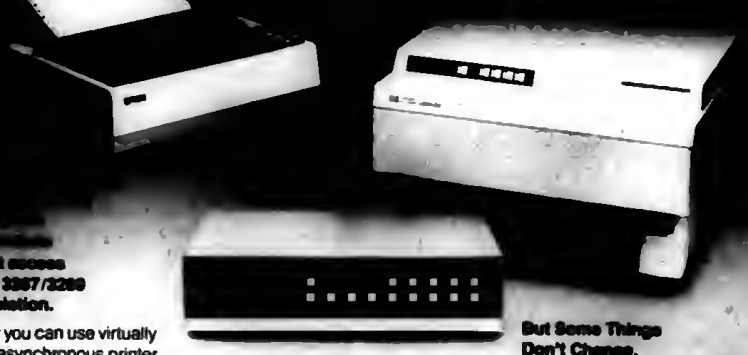
Anthony Percy, director of product planning at Applied Data Research, Inc., said the use of the 9370 as a data base machine is in doubt. He claimed that IBM is just now beginning to understand data base applications on mainframes and said it has even farther to go before mastering distributed data bases — the most likely data base use of the 9370.

In addition, he pointed out that VM is not good for distributed use and said IBM's VSE would be better for a distributed data base aystem. But if that were used, Transparent Services Access Facility (TSAF), the only peer-to-peer communications facility announced with the machine, could not be used, because TSAF requires the VM operating system.

Colony said IBM's DB2 software package is the company's strategic data base product.

But DB2 is MVS-based, Colony pointed out, so it could not be used with a peer-to-peer VM TSAF 9370 network.

Plug Any ASCII Async Printer Into IBM 3274



host access and 3287/3289 emulation.

Now you can use virtually any asynchronous printer any place you can plug in an IBM 3287...

Connect an HP Laser Jet, Xerox 2700, NEC Spinwriter, Epson FX-80, Okidata/ML92, or an IBM Proprinter to your mainframe host.

The choice is yours from hundreds of brands and models with baud rates to 19.2K bps and parallel print rates to 26 pages-per-minute!

This *newest* InterLynx/3287 is easy to install. Configure it from virtually any async terminal connected to the serial port or use the convenient front panel.

(Options are stored in non-volatile EEPROM.)

What's New?

- Printer setup strings are now user definable, making it easier to work with laser printers.
- Pseudo-transparency triggering is now user definable and allows taking direct control of the ASCII printer generating computer graphics, alternate character sets and other device unique outputs.
- Print rates are now up to 26 pages-per-minute.
- Translation tables are now easily user modified.
- Xerox's SNA SCS code 36 is now supported.

But Some Things Don't Change.

InterLynx/3287 is still an easy to use printer interface connecting inexpensive ASCII async printers to IBM 3274. It's easily connected to the host and for pennies a day gives steady, reliable service.

More than 7,000 InterLynx/3287s are in use worldwide. They're backed by a 12 month warranty and an experienced tech support team.

Get the full story today. Call (213) 320-7126 for more information and the name of your nearest factory representative. In Canada call (613) 748-9751. In UK call (0753) 76537

"Your Lynx® to IBM"

LOCAL DATA

2771 TOLEDO STREET, TORRANCE, CA 90503 TLX 182518

DG unveils X.400 link

BY ELISABETH HORWITT
CW STAFF

WESTBORO, MASS. — Data General Corp. last week joined the swelling ranks of big-system vendors that have announced support of the CCITT X.400 electronic mail standard. The company unveiled DG/X.400, which allows users of its Comprehensive Electronic Office software system to exchange electronic mail with any other vendor's system supporting the X.400 protocols.

The announcement was made just in time for the X.400 interoperability demonstration, scheduled to be held at the Hanover Fair in West Germany next week. Computers from 14 manufacturers, including Digital Equipment Corp., Hewlett-Packard Co., DG and several leading European vendors, are slated to exchange documents via X.400 protocols. All 14 vendors reportedly are using the demonstration to test interoperability among their X.400 implementations.

Despite growing X.400 support, the standard's potential for providing multivendor connectivity will not be realized until different vendors' implementations have been certified as interoperable by an independent party, according to David Terrie, president of Boston-based Newport Consulting. The Corporation for Open Systems reportedly is working on such a testing facility.

DG/X.400 prices range from $660 for the DS/7500 system to $10,450 for the MV/20000. Shipping is to begin in July.

COMPUTERWORLD

Fill out and mail in the attached postage-paid envelope.

Please enter my subscription to COMPUTERWORLD at the low Special Introductory Rate of just $38.95 for 51 issues — a savings of $5 off the basic rate. Plus, I'll receive the COMPUTERWORLD FOCUS issues FREE with my subscription.

☐ Payment enclosed ☐ Bill me
☐ Charge my credit card ☐ AmEx ☐ VISA ☐ Mastercard

Signature _____ Card Expires _____

FIRST NAME M I LAST NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

Address shown: ☐ Home ☐ Office

☐ I'm already a subscriber, but I'd like to extend my subscription at this special low rate. (Attach mailing label above.)

Canada, Central & South America $110/ Europe $165/ All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars

Please complete the information to the right to qualify for the special introductory rate.

Basic Rate: $44

COMPUTERWORLD

Detach here, place in envelope, and seal securely.

Please indicate your business function and computer involvement below.

1. BUSINESS INDUSTRY (Circle one)
10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government–State/Federal/Local
65 Public Utility/Communications Systems/ Transportation
70 Mining/Construction/Petroleum/ Refining/Agriculture
80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Computer Service Bureau/Software/ Planning/Consulting
90 Computer/Peripheral Dealer/Distributor/Retailer
75 User, Other _____
95 Vendor, Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MGT.
19 Vice President, Asst. VP
21 Dir., Mgr., Supvr., IS/MIS/DP Services
22 Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
23 Dir., Mgr., Supvr., Analyst of Systems
31 Dir., Mgr., Supvr., of Programming
32 Programmer, Methods Analyst
35 Dir., Mgr., Supvr., OA/WP
36 Data Comm. Network/Systems Mgt.
OTHER COMPANY MANAGEMENT
11 President, Owner/Partner, General Mgr.
12 Vice President/Asst. VP
13 Treasurer, Controller, Financial Officer
ENGINEERING
41 Engineering, Scientific, R & D, Tech. Mgt.
SALES
51 Manufacturing Sales Reps., Sales/Mktg. Mgt.
OTHER PROFESSIONALS
90 Consulting Mgt.
70 Medical, Legal, Accounting Mgt.
80 Educators, Journalist, Librarians, Students
90 Others _____ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as a user, Vendor or consultant
A Mainframes/Supermins
B Minicomputers/Small Business Computers
C Microcomputers/Desktops
G Communications Systems
E Office Automation Systems
F No Computer Involvement

3317-6709

Unix version for 386 bows

Microport beats AT&T, Microsoft to punch in booming field

BY PEGGY WATT
CW STAFF

SCOTTS VALLEY, Calif. — Microport Systems, Inc. last week announced a version of Unix System V.3 for Intel Corp. 80386-based personal computers, hoping to gain a foothold before AT&T and Microsoft Corp. ship their recently announced 80386 implementations.

The new Microport Runtime System V/386 is scheduled to ship in April and is slated to include many features of its existing port of Unix for the 80286 microprocessor, Microport President Chuck Hickey said.

But one analyst, while applauding Microport's bold jump into the 80386 market with a System V.3 release, cautioned that Microsoft will be hefty competition, even with a delayed product.

'Time to carve a niche'

"Microport may have a head start, but the race is not always to the swift," said Brian Boyle, director of research for Novon Research Corp. in Berkeley, Calif., a firm that focuses on the Unix marketplace. "The smart money bets on the strong. But Microport has time to carve out a niche."

Hickey said Microport plans to promote 80386-based systems running its Unix as scientific workstations in competition with Sun Microsystems, Inc. in Mountain View, Calif.

"Unix is going to become a commodity market," Hickey said. He predicted price and feature wars will result as the market grows and that every player's share will increase.

Microport's Unix reportedly will run Microsoft MS-DOS applications, with MS-DOS running as an application itself under Unix through the Merge utility from Locus Computing Corp. in Santa Monica, Calif. Locus developed the equivalent Simultask for AT&T.

System manager version in works

Microport is also assembling an 80386 version of System Vision, a system manager now available for its 80286 Unix that includes Xwindows and Sun's Network File System plus some features of University of California at Berkeley's Unix 4.2 used by Sun.

A software development toolbox and text processor similar to those available for Microport's 80286-based products will also support Microport Runtime System V/386, Hickey said.

Microport Runtime System V/386 costs $299, which Hickey said he hopes will underprice competition from Microsoft and other upcoming System V-compatible Unix systems.

Merge priced proportionally

The development toolbox and text processor cost $199 each, and Hickey said the Merge function will be priced comparably to its 80286 version, which is priced at $149.

Hickey said System Vision is scheduled to be available by the end of the year. However, he declined to release the price of System Vision.

Hickey said Microport ships approximately 300 units of its 80286-based version monthly.

Group claims FCC measure won't protect customer info

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A recently issued Federal Communications Commission order fails to protect the customer network data held by divested Bell operating companies from disclosure to Bell equipment sales personnel, a major user organization has charged.

The International Communications Association (ICA) argued that information about multiline customers, such as their local service and usage data, is proprietary and should not be disclosed without written consent from the customer.

The issue concerns an FCC order issued Jan. 12 that allows the divested Bell operating companies to integrate their customer-premise equipment sales units with their network services operations instead of requiring separate subsidiaries.

'Unrestricted access'

The FCC order established procedures for protecting customer proprietary-network information, but the ICA said the procedures allow Bell equipment sales personnel "free and unrestricted access to customer proprietary-network information unless the customer takes affirmative measures to request confidential treatment of the information."

The ICA complaint was made in a petition asking the FCC to reconsider its customer proprietary-network information decision and to adopt a requirement for prior written consent.

When the FCC first proposed the order in March 1986, it required the kind of prior written consent the ICA and other users groups wanted.

Shares ruled insignificant

But the divested Bell operating companies argued — and the FCC agreed in its final order — that the Bell companies have such small shares of the equipment market that they cannot abuse network information.

Users groups are concerned that the divested Bell operating companies could use customer proprietary-network information to identify potential customers for their equipment offerings and could favor buyers of their equipment in providing or maintaining access to the network.

The ICA said that users should control the dissemination of proprietary data to any customer-premise equipment vendor, especially the divested Bell operating companies, which have monopoly power over local exchange services.

PC-based insurance system goal to ease access to benefit data

BY ROSEMARY HAMILTON
CW STAFF

BOSTON — Aetna Life & Casualty Co. recently announced plans to market a personal computer-based system that would enable clients to access benefits data stored on Aetna's mainframes.

The system, a prototype of which was demonstrated here last week, is intended to lessen the work loads of Aetna representatives and benefits managers at clients' sites as well as provide easy and immediate access of data to employees.

Aetna officials said the system was tested within the company late last year and will be generally available in the second quarter. The system will offer one model for employee use and one for a benefits manager. The software was developed with Interactive Images, Inc.'s Easel graphics programming tool. It will be packaged either with an IBM Personal Computer AT — the benefits manager model — or within a large kiosk structure for employees.

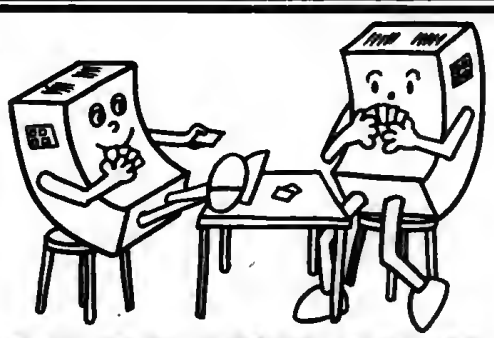
Aetna has offered a few other software packages to managers at client sites for inquiry purposes, but those packages have required programming knowledge and training, according to Lory Oliver, Aetna development supervisor on this project. The new system, based on a touch-screen, menu-driven format, will enable end users to access Aetna data easily, she said.

Customers will have the option of getting direct access to the Aetna Employee Benefits Division mainframe or requesting monthly downloads of benefits data. Specifics on the direct-access method are being ironed out, Aetna said, but customers will probably be required to set up a direct leased line to Aetna's Hartford, Conn., headquarters.

Whether a user has direct access or receives monthly downloads, the actual interaction with the Aetna computer is limited to requests. In the case of a direct access, an employee can directly request benefits data, which will be downloaded to the on-site Aetna system.

At that point, users can initiate transactions, such as transferring funds, as well as perform "what-if" analyses on their accounts.

Aetna said each system will require customization, a part of the overall cost that the company would not release. The hardware and software portions of the product will cost $10,000 for the personal computer version and $13,000 for the kiosk version.



WHAT'S YOUR COMPUTER DOING WHILE YOUR OPERATORS ARE WORKING?

If your computer sits idle or runs at less than peak capacity while your operations staff is changing shifts, checking job results, taking care of restarts, notifying users or manually adjusting production schedules, then perhaps an automated job scheduling and production control system should be in the cards for you.

Stack the deck in your favor with CONTROL-M.

CONTROL-M provides the first NEW approach to automated job scheduling in almost a decade. With CONTROL-M your production keeps running because many tasks performed by your operators are automatically performed by CONTROL-M including:

- Job dependency checking
- JCL set up
- Condition code checking
- Restart and recovery
- User notification
- Automatic schedule adjustments

And, unlike other job scheduling products, schedule implementation is quick and easy, and CONTROL-M requires so few resources that you hardly know it's there. But your computer will . . . because it too will be working.

For information contact:

CALL
1-800-833-TONE
1-800-833-8663

TONE Software Corp
1735 Brookhurst
Anaheim CA 92804

IN CALIFORNIA AND CANADA
1-714-891-9460

Windows

CONTINUED FROM PAGE 1

They're going to wait and see if others develop Windows applications."

Infocorp analyst William Higgs says Creative Strategies' estimate of sluggish Windows use does not mean the proposed standard has been rejected.

"You really can't expect Windows to have very heavy volume shipment until you have Windows applications," he says.

However, Microsoft is clearly holding its breath. "The timing for major applications is right now," says Tandy Trower, director of retail marketing for Microsoft's systems software group.

Trower adds that Windows sales are in line with projections.

Trower says he expects Windows applications to at least double in the next year, joining applications from approximately a dozen pioneer developers that have products out now.



Borland's Kahn

The major players in personal computer software remain lukewarm or noncommittal. Lotus Development Corp. says it will develop at least one new application to run under Windows but will not change its flagship 1-2-3 for the graphical environment.

Ashton-Tate says only that it is reviewing the various operating environments and that Windows appears to be the best.

Even Microsoft has failed so far to release any of its business applications developed under Windows. Microsoft applications, like other vendors' products, take over the entire screen when they run with Windows.

"You'd think Microsoft. . . would make all their applications run under Windows," says Renee Plummer, information center manager at AT&T in New York.

Microsoft has promised to ship programs that take advantage of the multiple-window environment. A Windows implementation of its Excel spreadsheet, now an application for Apple Computer, Inc.'s Macintosh, is expected late this year.

In the meantime, many corporations are evaluating copies of Windows and are waiting for applications.

"The acceptance [of Windows] is kind of spotty," Plummer says. She estimates that of the nearly 1,000 users the information center supports, only 35 utilize Windows.

Other users have complained of technical problems. "A lot of programs crash under it," says Sandra Jones, an automated systems analyst who oversees end-user computing in the finance department of Northrop Corp. located in Hawthorne, Calif.

Because Windows demands control of memory, heavily random-access memory (RAM)-resident programs clash and may never adapt to the interface, Microsoft's Trower says. Microsoft has built some common RAM utilities into Windows, including a notepad, calendar, card file and calculator.

Philippe Kahn, president of Borland International in Scotts Valley, Calif., is among the most vocal critics of Windows.

"People are afraid Microsoft is going to take control of the operating system," Kahn says. He declines to disclose his company's plans to become Windows compatible.

Borland and other developers, includ-

Status report:

Some two dozen Windows applications have already hit dealers' shelves, and Microsoft Corp. is waving a list of more than 120 independent software vendors that have signed up to develop or adapt applications to run under the Windows interface.

But even Microsoft Windows evangelist Steve Ballmer, vice-president of the systems software group, acknowledges that he still has to lobby.

"We'll know Windows has made it when we meet with an independent software vendor and he doesn't worry about whether a user has Windows yet, and whether the user will have to buy it to run their application," Ballmer says. Microsoft licenses runtime versions and offers bundling options to allay those concerns.

Dozens of marketing pacts

Microsoft has marketing agreements with two dozen other vendors, some of which have enhanced Windows as part of an OEM contract. Among the U.S. resellers are AT&T, Hewlett-Packard Co., Digital Equipment Corp., Wang Laboratories, Inc., Zenith Data Systems Corp. and Tandy Corp.

Overseas, Microsoft has a handful of vendors in Europe and Japan.

Independent vendors' products now shipping include In-A-Vision computer-aided design and Windows Draw presentation graphics from Micrografx, Inc. in Richardson, Texas; PC Image, an image processor for use with scanners from Datacopy Corp. in Mountain View, Calif.; PC Scan Plus and Publish Pac from Dest Corp. in Milpitas, Calif.; Actor, an object-oriented programming language from The Whitewater Group in Evanston, Ill.; and Nexpert Object, an



INDUSTRIAL STRENGTH.

The Datasouth High Performance Matrix Printers.

Tough customers demand tough printers. The kinds of printers that go where the work is, and get the job done. Printers built to work three shifts a day—all week, all month, all year—and never take vacations. Printers so solid and durable you'd think they were dropforged. Printers like the Datasouth DS 180 and DS 220.

That kind of industrial-strength performance comes from knowing what a tough customer needs: rugged medium-speed printers that combine outstanding performance with the strength to pound out multipart forms up to 6 layers thick. Printers that put all the controls right on the front panel, so they're easy to use. And printers that offer a choice between a 180 cps draft mode printer, and a 220 cps multimode that produces Near Letter Quality text at 45 cps.

And at Datasouth we practice what we preach. The DS 180 and DS 220 work side-by-side with the hard-working people who build them right here in our Charlotte, North Carolina plant.

Put an industrial-strength printer to work for you. To find your nearest Datasouth distributor, call us at 1-800-222-4528.

Datasouth

AMERICA'S HIGH PERFORMANCE PRINTER COMPANY

P.O. Box 240947, Charlotte, NC 28224, (704) 523-8500, Tlx 6843018, DASO UW SALES, 1-800-222-4528, SERVICE 1-800-438-5050; West Coast office: 415-940-9828.

ing Microsoft, say applications development for Windows is too difficult to be done quickly. Although Windows might share many characteristics of Apple's Macintosh interface, the structure is quite different.

"Porting over applications is not as easy as it might sound," says Dave Winer, president of Living Videotext, Inc. in Mountain View, Calif. "Our interest in Windows as a market is waning."

Microsoft says more than 100 vendors have publicly committed to developing Windows applications. However, some of those developers say privately that they are working slowly, only to be ready to ramp up if Windows picks up in popularity.

"Expending a lot of money on Windows for a smaller company like us is a gamble," says Vern Raburn, chairman of Symantec Corp. in Cupertino, Calif. "We don't hear anybody asking for it."

But, as Infocorp analyst Higgs points out, Microsoft has made some Windows converts among small developers that were willing to leap on new technology.

Many observers are also waiting for IBM's statement on Windows. So far, IBM's only reaction has been to place Windows on its vendor label sales list, to sell to customers who request it, according to an IBM spokesman. IBM also markets Windows rivals, such as GEM from Digital Research, Inc. and IBM's window interface, Topview.

"We knew Windows would be a slow-burn process," comments Steve Ballmer, vice-president of Microsoft's systems software group.

Several corporate developers say Windows may become more useful as they get more Intel Corp. 80386-based systems. They also point to emerging graphics coprocessors from Intel and Texas Instruments, Inc. that will speed Windows, even on 80286-based systems.

"I think Windows is the one that can make it, down the line, with the 80386-based systems," says a systems developer at a major manufacturing firm that is developing Windows applications to interface with mainframes, minis and a personal computer network.



Steve Ballmer

Todd Greeno, manager of office technology for Pfizer, Inc. in New York, agrees. "We sort of looked at Windows before, and it was such a memory hog, there wasn't much value in running it on a smaller machine," he says.

Infocorp's Higgs suggests Microsoft might have asked for too much too soon in pushing for a Windows standard.

"Windows is not a product for today's environment, and even Microsoft is looking at it that way," he says.

Microsoft acknowledges that the Intel 8088-based machines, which are still heavily in use, are not fast enough for Windows to perform well.

"Now you have a reason to buy an IBM Personal Computer AT," Microsoft Chairman Bill Gates said when Windows was released.

Gates has called Windows strategic to Microsoft's success and part of his goal to put a PC on every desk and in every home.

"But if Windows died, Microsoft would still be in good shape," Ballmer says.

Microsoft's Windows promoters do not deny they still face hurdles.

"It's not a time to sit back and take it easy," Trower says. "We're still just starting. No one said the race would be won in the first lap."

believers

expert system shell from Palo Alto, Calif.-based Neuron Data.

The most significant recent release is Aldus Corp.'s Pagemaker, which ushered in a desktop publishing flood on Apple Computer, Inc.'s Macintosh. Its use of Windows' built-in drivers and fonts "points up the advantages of writing to Windows," says William Higgs, analyst with the market research firm Infocorp in Cupertino, Calif.

Broad appeal needed

But Windows applications need broad appeal, notes Tim Bajarin, president of Creative Strategies Research International, a San Jose, Calif.-based market research firm. "If the first major product out under Windows was a mass market product, then it would have an impact," Bajarin says.

Paperback Software International President Adam Osborne recently said his company will release a line of applications that run under Windows, and Microtopro International Corp. said its upcoming desktop publishing package will be designed for the Windows interface.

Several vertical market programs are available, including high-end instrumentation interfaces from HP-Genenchem in South San Francisco and two legal expert systems generating tools from Legal Ware, Inc. in Toronto. Mindscape, Inc. in Northbrook, Ill., is selling a game, Balance of Power.

Windows has also gleaned hardware support from Intel Corp., which bundles Windows with its memory-expanding Above Board. In addition, several manufacturers of monitors, pointing and output devices have developed Windows drivers for their products.

PEGGY WATT



EDITORIAL

DOS and don'ts

WHAT A BEFUDDLING time to be evaluating major microcomputer purchases.

This situation is being brought to you by a diverse cast, including Microsoft Corp., IBM, a couple of thumbnail-size silicon chips called the Intel Corp. 80286 and 80386 and a host of software developers who are probably pretty confused at this point.

To put the situation into perspective:

- IBM announced a high-speed microcomputer called the Personal Computer AT 30 months ago, and roughly two million of them are on desks in businesses across the U.S.
- To date, there is no widely accepted operating system that begins to tap the potential of the AT, which is based on the 80286 chip. Specifically, users cannot economically exceed the 640K-byte main memory barrier and cannot get the AT to perform multiple tasks simultaneously.
- Microsoft, which has been known to miss a deadline or two, now hints that a commercial version of 286-DOS, which can perform the above functions, is now in doubt before the end of this year.
- Meanwhile, a new generation of micros, based on the 386 chip — which can support multiple operating systems in native mode — are coming on stream. Any sort of DOS specifically made for the 386 is two years off, Microsoft says.
- *But*, within a year users may see a Microsoft Xenix-AT&T Unix marriage giving birth to a multitasking, multiuser Unix release for 386 machines. Want to run packages written for the old generation of micros? Just load MS-DOS on the 386 along with the new Unix, and away you go.

So software developers, which bring you all those applications, must be wondering just which operating system they should invest time in writing applications.

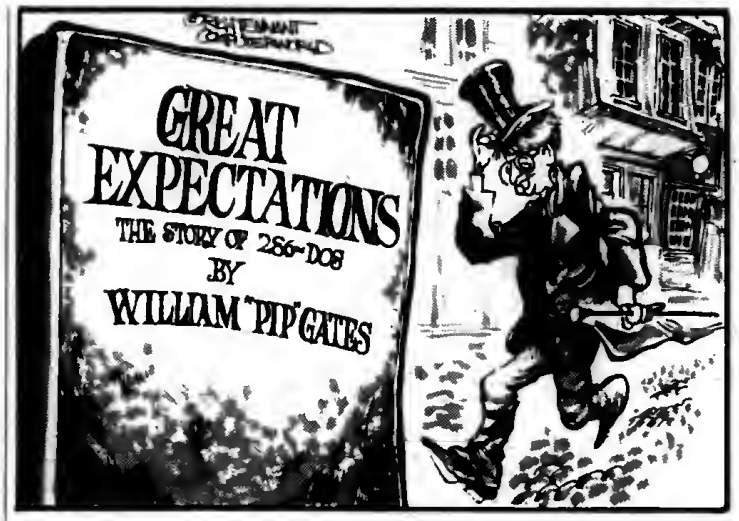
WHEN YOU LOOK AT THIS and other data, you have to first wonder why anyone, including Microsoft, would bother with the 286, the AT engine.

The answer is that Microsoft is being paid handsomely by IBM to do so by virtue of a long-term development agreement the two hatched in 1985. IBM made certain tacit commitments to its customers who bought those two million ATs, commitments saying it would provide the software to exploit the machine some day.

But now we see Microsoft looking to Unix and elsewhere for future operating system development. And why not? Unix was developed as a portable, multitasking, multiuser operating system. The 386 chip was developed with the same criteria in mind.

Further, there is a lot of Unix potential in the user marketplace. A recent *Computerworld* survey of 700 business sites indicates the support for Unix or Xenix during the next two years will grow 200%, while support for Microsoft MS-DOS and IBM PC-DOS will drop dramatically.

All and all, the 386 machines look better all the time.



LETTERS TO THE EDITOR

Ethical perceptions

Thanks for your article, "Criminal past of IEEE officer went undisclosed" [CW, Feb. 16], the revelation of Stanley Mark Rifkin's criminal past.

I call attention to the quotation from National Bureau of Standards security specialist Stuart Katzke: "People who make amends for their past mistakes deserve a second chance and shouldn't be hounded for the rest of their lives."

The activity for which Rifkin was convicted and sentenced was not an error or fault in judgment. He was convicted of deliberate theft through knowledge and a position of trust. To equate such action with a spelling error is an exercise in the lowest form of semantics.

For one in a position of trust who knew of Rifkin's felonious activity to conceal that knowledge from a voting constituency is a mistake of some magnitude. Katzke's perception of ethics is certainly questionable.

Those who bandy the words "professionalism" and "ethics" should take heed to the consequences of loose interpretations. Be advised that the codes of ethics of the Data Processing Management Association (DPMA) and the Institute for Certification of Computer Professionals (ICCP) strictly prohibit membership and certification, respectively, of convicted felons.

To reward a miscreant with membership, and office, in a professional association implies that the professionalism and ethics of the association's members are of questionable substance and value. Katzke owes IEEE leaders and members an apology.

Robert R. Cromer
Irving, Texas

Cabling vs. diskettes

As a vice-president of a 3½-in. floppy disk drive manufacturing firm for personal computers and compatibles, I respectfully disagree with William Zachmann's article, "Bridge tool a winner" [CW, Feb. 2], in which he states that a cabling system is the easiest and most convenient solution to the problem of transferring data between 3½-in. diskette-based laptop and 5¼-in. disk-based desktop computers.

This analysis misses the main incongruity between laptops and cabling systems. Laptops are designed for portability and operation in the field. The main advantage of the 3½-in. diskette is its size and durability — it can easily be mailed or carried in a shirt pocket.

Relying on a cabling system to transfer data from a laptop to a desktop computer means the user is forced to transport the laptop to an office, which is clearly an unnecessary restriction. Carrying the 3½-in. diskette is far easier.

Computer users aren't looking for cables when they buy a laptop computer. They're looking for portability. Given the need to download information to a desktop system, only a 3½-in. disk drive system for their desktop can guarantee them that portability.

Michael D. DeLapa
Vice-President
Manzana Microsystems, Inc.
Goleta, Calif.

Managerial catering

Kudos to senior editor Glenn Rifkin and the Computerworld staff for the Executive Report on users groups, "The users group explosion: Do they really have influence?" [CW, Feb. 9].

Our group — the Microcomputer Managers Association (MMA) — differs from others in that our efforts are neither product-specific nor oriented primarily toward end users. The MMA caters to microcomputer managers and provides different forums for the discussion, demonstration and development of microcomputer technology and microcomputer management. We also throw a few good parties.

Readers interested in learning more about the MMA should call Annie Zdinak at 800-237-0316; in New Jersey, 201-569-6919.

Alex Kask
President
MMA
Englewood Cliffs, N.J.

This week in history

March 7, 1977:
The Social Security Administration succeeds in penetrating the security system designed to protect the computerized records of millions of Medicare patients.

March 1, 1982:
The U.S. Supreme Court grants a deaf lawyer permission to use a CRT terminal when he argues a case asking a school system to provide a deaf student a sign-language interpreter. The decision marks the first time the Supreme Court has allowed the presence of any recording system other than its own during arguments.

What's love got to do with it?

AMY WOHL



An unexpected wedding occurred recently. H. Ross Perot, superpatriot and superentrepreneur, having left General Motors Corp. bloody (but $750 million richer) and certainly unbowed, married another superentrepreneur, Apple Computer, Inc. founder Steven Jobs.

Jobs has been teasing the computer community, keeping us fairly in the dark about his new company, Next, Inc. Oh, we've seen showy announcements about how they designed their clever logo. And we've had little hints of direction and purpose. (For the record, Next is a start-up company developing a workstation for the educational community.) But real information as to what, how and when has been pretty scarce.

Suddenly, with on hint that Jobs was looking for additional funding for Next (and he probably wasn't), comes the news that Perot has made a major investment in the start-up (one that puts the company's value in the $100 million ballpark) and joined its board of directors.

I stifle a giggle imagining the first board meeting at which they don't agree. What will be the subject of their first falling out — and what the result?

Fruit-juice bill

Imagine Jobs' laid-back California style and Perot's hard-driving, aggressive manner colliding. Maybe it will be over the fruit-juice bill. (The Macintosh development team is reputed to have drunk $100,000 of the stuff a year.) Actually, that'a unlikely; Perot is known for his strong support of employees, and all that fruit juice was a great investment for Apple. (Just assume that each dollar of orange energy kept a programmer working just 10 more minutes.)

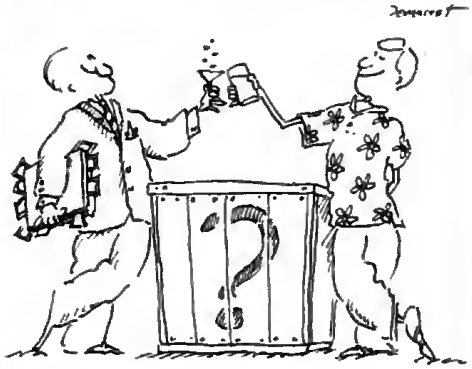
Maybe the collision will be caused by product design. Let's assume history is a good predictor.

In that case, Jobs is sure to go for a unique design, optimizing technology but demanding that a new market be built around a new standard. Perhaps Jobs' success with the Macintosh will attract development investors faster — or perhaps the knowledge that Apple agreed to add IBM compatibility to its Macintosh line will make them wait.

Perot, on the other hand, is sure to argue for accepting and taking advantage of standard environments. His Electronic Data Systems Corp. succeeded by simply knowing everything about Big Blue's hardware and software and supporting it better and faster than IBM could.

Where will they compromise? In this case, timing is probably the issue. Next is likely to be pretty far along by now. Industry sources expect some type of public product disclosure by the end of this year.

So Perot has no doubt agreed that he likes it — whatever it is — and his advice will initially be directed to the business of getting the product to market, the business of running the business and the business of what the next Next product will look like.



Perhaps their disputes will be focused on style. For instance, the announcement: Perot would vote for a slick hotel in San Francisco with phalanxes of pin-striped vice-presidents glad-handing university presidents over pate and champagne. Jobs might go for orange juice and tofu with the graduate students in some Silicon Valley hangout where T-shirts and Nikes are de rigueur. But Jobs has been known to don a suit when the occasion demanded (albeit an off-the-wall designer's style) and Perot surely knows the value of making the customers happy. Maybe they'll divide the announcement day responsibilities and each meet with their natural constituencies.

A real question — not yet answered or obvious — is exactly what this relationship is all about. Is this Perot simply making an investment (small, given his resources) and looking for something to do while he plans his next move? Or is Jobs looking for a new father figure to replace his previous relationship with John Sculley? Clearly Perot represents success, authority and the possibility of approval, but Jobs seems to have matured since leaving Apple and Perot seems too clear headed to invest in emotion rather than "significant upside potential," as my broker likes to say.

In the end, what Next is doing (that is, what the product is doing) is probably more important to its success or failure than Steve Jobs, Ross Perot or our speculations about the reason for this surprise nuptial. If it's a great product, properly timed, positioned and priced, it will work. If one of those all-important variables is off a little or a lot, it probably never mattered anyway.

Jobs has a lot riding on Next — the need to prove Apple wasn't just a fluke, an accident of timing or something that succeeded in spite of, rather than because of, his efforts. Perot would like to prove his business acumen is as sharp as ever, and that GM was a fool to allow cloudy thinking and the need for unnecessary control to lead it to divorce the best businessman on the board. Perot will very much want such a visible investment to visibly succeed.

But that may, in fact, be the point. Perot's investment is in itself an indication that he thinks Jobs is sitting on something good. And the groom was willing to bring a considerable dowry to the marriage to ensure its financial success and to ally himself with a new and likely winning team.

We've all known strange marriages that go on and on while friends and relatives ask, "What do they see in each other? They're so dissimilar." The answer usually lies not in the fact that opposites attract, but rather in that the bride and groom share attitudes and interests that observers haven't noticed.

In this case, Jobs and Perot have a lot in common: They're both successful businessmen; they care a lot about the people who work for them; and they have a reputation for being opinionated and passionate about what they believe. That's more than a lot of successful marriages have going for them.

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

How to succeed in the CIO business

Help the customers the CEO cares about

FREDERIC WITHINGTON



Some organizations have chief information officers, though they are rarely called that. Whatever their titles, they can be distinguished from ordinary data processing managers in three ways.

First, CIOs are invariably vice-presidents or another type of officer. Second, they report directly to the president or at least to a senior vice-president of operations, never to a staff or departmental VP. Perhaps most important, the CIO is part of the management cadre responsible for the organization's future; indeed, the CIO is often responsible for all strategic planning, in addition to all matters pertaining to information technology.

Many data processing managers would like to be promoted to CIO. However, creation of such a new officer-level position requires action by the directors as well as the chief executive officer; they must believe the promotion is justified.

How do CEOs and directors feel about data processing managers? In most cases they view them as the people who:

- Get the paychecks and bills out
- Provide office machines
- Provide telephone service.

These functions are important — even essential — but they have little to do with the organization's strategic direction. So, the CEO and directors are not about to see the reason to appoint a CIO. (This point is overstated. In many organizations, the DP manager is recognized as a key contributor to productivity and efficiency of operations. Nevertheless, the job is perceived as a staff one, outside the core of the business.)

How can the DP manager change the CEO's perception?

Not by providing integrated office automation. These systems rarely produce a demonstrable benefit equal to their cost; the benefits must be taken on faith. Besides, CEOs tend to look on office employees as necessary evils.

Cost related to revenue

The cost of salesmen, customer service and manufacturing employees can be directly related to revenue. Even product designers, acknowledged to be essential, must regularly re-prove themselves.

And not by providing decision support systems to the CEO. His decisions, mainly about personnel appointments and gambles for the future, are necessarily based primarily on intuition and faith.

The limited amount of relevant factual information a CEO needs can usually be presented in a simple summary with little need for fancy personal computer graphics.

The thing to do is provide systems that help the people the CEO cares about. The most important of these are the customers. Some information systems help the customers and also serve the organization's interests. Automated teller machines please depositors and also reduce personnel costs; reservation systems increase responsiveness and also permit more precise planning; on-line order entry permits both customer and supplier to reduce inventories.

The CEO also cares about the employees who produce the revenue. Dispatching, computer-integrated manufacturing, integrated customer information and source data entry systems are examples of systems that help employees by providing better information to support their activities and at the same time increase efficiency. Generally speaking, any organization that has appointed a CIO is one that is heavily into the kinds of systems mentioned above.

Management's perception

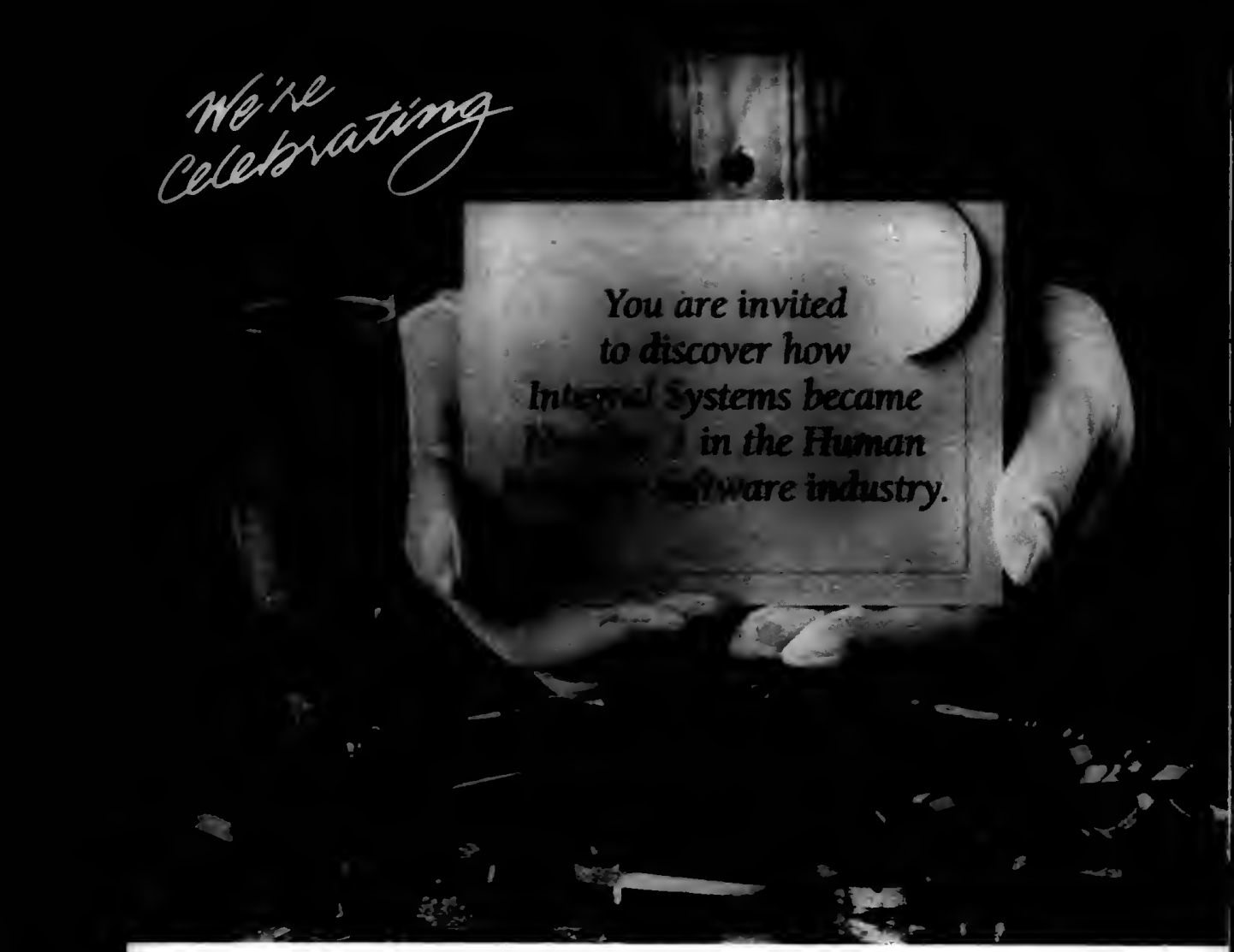
So if you want to become a CIO, don't stay in your office listening to vendor salesmen talk about inwardly directed networks with vague purposes. Get out among the customers and line employees. Think up systems that will simultaneously improve their jobs and help your company, and you'll be surprised at the change in management's perception of your value.

If you can't think up such a system, your organization may simply be insufficiently information-intensive to justify a CfO, at least at present.

If you can think of such a system but can't sell it to management, either you don't understand management's values or you haven't learned to communicate properly.

In any case, you will have learned something about becoming a CfO, some time, somewhere.

A 30-year veteran of the computer industry, Withington was a vice-president of Arthur D. Little, Inc. and is now an independent consultant. He has written four books and more than 60 articles and papers.



Integral Systems sells more human resource software to the IBM marketplace than anyone in the industry. *Here's why.*

We're specialists. For 15 years we've dedicated ourselves exclusively to human resource management. So when you talk to us you're talking to the industry's expert.

We support our clients. We offer a full range of high quality training, consulting and maintenance programs. In fact, one third of our organization is dedicated to client support. They don't do anything else. That's why you're insured a successful implementation. It's our number one objective.

Our software is technically innovative. We spend nearly twice the industry norm on R&D to see that it is. So you can count on products that are developed and delivered to work in a native mode with the very latest data base technology including DB2. That's why we're the industry standard.

The proof. Our reference base is the most prestigious in the industry. Companies like Ford, RCA, Harvard University, GTE, First National Bank of Chicago, MCI, Hartford Life Insurance, ITT, 3M Canada, DuPont Canada, Toyota, The State of California and over 450 others.

INTEGRAL SYSTEMS

THE DECIDING FACTOR

Please send me more information

Name_____

Title _____

Organization _____

Number of Employees _____

Address _____

State or Province/Zip _____

Telephone _____

Hardware _____

Database environment _____

Mail to Integral Systems 2185 N. California Blvd., Walnut Creek, CA 94596

PRODUCT HIGHLIGHTS

- Payroll Processing & Reporting
- Personnel Management
- Benefits Administration
- Pension Administration
- Applicant Tracking
- Position Control
- Microcomputer Products

HARDWARE—IBM Mainframes, PCM's and the IBM System/38

DATA BASE ENVIRONMENTS—DB2, SQL/DS, VSAM, IMS, IDMS, ADABAS and DATACOM

ON-LINE ENVIRONMENTS—CICS, IMS/DC, IDMS/DC, COM-PLETE

FOURTH GENERATION LANGUAGES—CSP, ADS/OnLine, NATURAL, IDEAL

To help make your decision, call our toll-free number for a fact-filled brochure. In the U.S. call **(800) 824-8199**, in California, **(800) 824-8198**. Locally and in Canada **(415) 939-3900**

Sales and support offices located throughout North America.

SOFTWARE & SERVICES

SOFTWARE NOTES

Laptops gain disks

Computer Associates International, Inc. is plans to offer its micro products — Supercalc 4, Superproject Plus, Easywriter and others — on 3½-in. diskettes as well as 5¼-in. diskettes to accommodate users of the IBM Personal Computer Convertible laptop. Previously, only IBM offered software in both disk forms.

The SAS Institute, Inc. is scheduled to dedicate a new five-story research and development facility March 10 at its 11-building Cary, N.C., campus. The $6.5 million building will house 500 research and development staff members.

MDBS, Inc., the developer of Knowledgeman/2 and Guru, has entered into a distribution agreement in Japan to have Guru distributed by Knowledge Engineering Laboratory Corp. of Tokyo.

A videotape of a panel discussion on automated Cobol restructuring sponsored by the **Software Maintenance Association** in Chicago Jan. 12 is available for $75 from Jamie A. Goossens, who can be reached at (312) 938-5364. Panel members were Eric Bush, chairman of Language Technology, Inc.; J. Cris Miller, a principal of Peat, Marwick & Co.; and Henry W. Morgan, vice-president of Group Operations, Inc.

Concurrent DBMS goes distributed

BY ALAN ALPER
CW STAFF

TINTON FALLS, N.J. — Concurrent Computer Corp. last week brought out Release 8.0 of its Reliance Plus on-line transactional processing and relational data base management system, providing its 3200-family processor users with remote and distributed facilities.

At the same time, the firm unveiled an office automation environment for Reliance Plus featuring word processing, electronic mail, calendar and diary, telex communications, personal computer connectivity and decision-support software, the firm said.

With the distributed capabilities of Release 8.0 of Reliance Plus, users can create nationwide manufacturing and distribution systems, retail networks and branch-office or departmental computing networks, Concurrent officials said.

For example, Release 8.0 enables a user in a manufacturing business to search and fill orders from either local inventory or any other inventory on the firm's network, according to Russ Lombardo, manager of transaction processing marketing. The logic routing of an order query can be contained in an application written for the purpose. The query can be routed by the application over Concurrent's Pennet network, he said.

Upon locating the product, the system can immediately order it, update the inventory data base, bill the customer and ship the product — all from a remote system, Lombardo explained.

Other features of the release are a security system with control levels of authorization; IBM SQL-like commands, such as SELECT and FETCH, that can be embedded in Cobol, Fortran or C applications; a record-transfer utility; support for a virtually unlimited number of terminals; and light-pen support.

In addition, Concurrent is offering three optional packages with Release 8.0: Reliance Monitor, which provides tools for monitoring resource usage and tuning production environments; Reliance Access, which combines the Query/Update software into a single package; and Reliance Interface, which allows users to build application interfaces into Reliance Plus from high-level languages under Concurrent's OS/32 proprietary operating system.

Release 8.0 will be available in March and is priced from $3,000 to $24,000, depending on the processor model used. Reliance Access is priced from $1,000 to $5,000, depending on the processor model, while Reliance Monitor and Interface cost $2,000 each, regardless of processor model.

Reliance Office enables users to tailor systems to their specific needs by building OA functions in a modular form. The environment supports user-developed programs and third-party software while allowing access to IBM mainframes through gateways or links to other Concurrent systems.

The word processing option, called Lex, provides for document creation, editing and printing. TTR includes automatic

Continued on page 20

Bank lauds start-up's DB2 dictionary

Says three-year conversion project would not have been possible without it

BY CHARLES BABCOCK
CW STAFF

NEW YORK — A data dictionary for IBM's DB2 has been introduced by a newly formed company with no previous product history, Brownstone Solutions, Inc.

The dictionary is in use at a major New York investment bank that has started a three-year project to rewrite its production applications to work with DB2. Spokesmen for the bank commented on the dictionary on the condition that their institution not be identified. The principal spokesman is the supervisor of technical architecture for the applications conversion project.

The conversion project would not be possible without a dictionary, and no comparable product exists yet from other sources, the spokesman said. The dictionary remains a basic technical product, storing entity and data definitions in DB2 tables. "You have to know the entity-relationship model and understand it to use the dictionary. We built a lot of panels to hide the internals of the dictionary. We have a menu-driven front end now," the spokesman said.

The dictionary provides referential integrity to the conversion process, the spokesman added. Lack of referential integrity is one of the most frequently cited complaints about DB2.

The dictionary also supports creation of DB2 tables and is extensible; as new entity types are defined, they become available to all procedures that rely on the dictionary.

Although Brownstone Solutions is a newly minted company name, and the two principals have yet to establish a company telephone number, the bank proceeded with the dictionary because "we have to get this project up and going," the spokesman said. The young authors of the dictionary, Barry Brown, 27, of New York, and

Continued on page 20

Inside
• DG enhances CEO graphics. Page 30.
• Top Secret developer tackles DB2 market. Page 31.
• Sun rolls out Version 5.0 of Instagres. Page 35.



DG spruces up CEO graphics

BY ALAN J. RYAN
CW STAFF

WESTBORO, Mass. — Data General Corp. has announced two products it said it expects to enhance its CEO office automation software graphics.

DG/Fontstyles contains 12 presentation-quality typefaces that may be used with DG's existing graphics software packages — CEO Drawing Board, Trendview and CEO Wordview.

The font module is designed for DG's AOS/VS operating system and supports six filled and six unfilled font styles as well as international character sets, the vendor claimed.

The package is said to provide graphic arts-quality font capabilities licensed from Bitstream, Inc. in Cambridge, Mass., a vendor of digitized fonts.

Single-key charts

Users of the second product — the enhanced version of CEO Decision Base — can create charts from spreadsheets or data tables with a single keystroke, according to a DG spokeswoman.

Using the enhanced CEO Decision Base, a single function key selects data from spreadsheets or data tables to create charts that can be saved in the CEO filing system as graphics-kernel metafile documents, then edited using CEO Drawing Board, DG explained.

CEO Decision Base is integrated decision-support software for spreadsheet, personal data base and charting applications that includes bar, pie, line and surface-chart options.

The CEO software products support a variety of printers, according to Caren Spital, DG product manager. Those include DG's desktop laser printer and some dot matrix printers, several Hewlett-Packard Co. plotters and HP's film recorder device. Trendview also supports ink-jet printers.

"We currently do not support a page-description language output device," Spital said, "but we are looking to gain that support in the next nine months."

DG/Fontstyles costs $550 per license, and the CEO Decision Base software license is priced from $1,800. Both are available immediately, DG said.

Concurrent

CONTINUED FROM PAGE 19

numbering of footnotes and paragraphs, form-letter production, mass mailing with data base, a 100,000-word dictionary, sorting within documents, programming capabilities and a four-function calculator.

Scheduled for availability in April, Lex lists for between $3,500 and $10,000, depending on the processor model with which it is used.

The electronic mail option, NEM/32, allows users to create and send messages, including stored documents, charts, spreadsheets, reports, tables and non-ASCII files, to other users. A diary and calendar facility allows the user to schedule and route appointments throughout a network.

Currently available, NEM/32 is priced from $800 to $4,0000.

C-Telex, an automated telex system that works with NEM/32, is said to be capable of routing messages, including multiple copies, outside the network. Due to be available in April, it is priced from $2,000 to $8,000.

PC connectivity is achieved through the firm's Pennet PC software. The software enables the IBM Personal Computer, PC XT, AT or compatible to run Reliance Office residing on a 32-bit minicomputer. Pennet PC is fully compatible with Reliance Plus.

Pennet PC is currently being beta-tested, Lombardo said. Pricing and availability have not yet been determined, he added.

Bank lauds

CONTINUED FROM PAGE 19

Lewis P. Stone, 26, of Stamford, Conn., are "DB2 heavies," the spokesman claimed.

Brown and Stone are former Arthur Andersen & Co. technical service managers who were selected to develop an IBM DB2 workbench for a project that converted the applications of the New York State Employees Retirement System for use with DB2. The workbench included 300 screens and 100 DB2 tables to aid in developing applications under IBM's CICS, Stone said.

The prototype of the DB2 dictionary was developed in that project as well, be said. The New York bank is the firm's only installation to date, and the company has yet to hire a sales staff or establish a business address other than the addresses of the two principals. Brown can be contacted at 20D, 375 S. End Ave., New York, N.Y. 10280.

The dictionary is based on an entity-category-relationship model. Entities or types of objects and concepts are defined and have the relationships between them described and categorized. The categories allow different entity types to have common relationships. Brown and Stone said. Users can view and maintain entities, relationships, categories and text through IBM's Interactive System Productivity Facility. The dictionary costs $55,000, Stone said.



DB2 tool vendor: 'Let the market drive you'

BY ALAN J. RYAN
CW STAFF

HOLMDEL, N.J. — With two hits behind him, Bernard Goldsmith recently said finding the key to success in the mainframe software market lies in listening to the needs of the user. "If you let the market drive you, rather than your own technical desires, the odds are in your favor," he suggested.

Goldsmith, who developed Top Secret and Single Image Software, two big sellers for CGA Computers, Inc., has now jumped feet-first into the IBM DB2 market with his new company, Updata Software Co., located here.

Updata's productivity tool offering, available now, is called DB/Pro Edit. The software can display tables in full-screen, tabular or row format, which allows applications programmers to create test tables and display the results, the vendor said.

Using IBM's Interactive System Productivity Facility editor-style commands, rows can be inserted, deleted, replicated or changed interactively. DB/Pro Edit can also be used to create DB2 tables and allows existing table definitions to be used as templates for new tables, CGA said.

To monitor and tune system catalog tables, the software reportedly can build complex catalog queries without coding IBM's SQL select statements.

An IBM SQL Processor Using File Input (SPUFI) emulator allows use of existing SPUFI libraries. The software generates resulting tables that can be edited online. The product can be installed quickly and requires no changes to other software, Updata claimed. Licensing costs $4,500 per year, Goldsmith said.

The chief executive officer of Updata said he has entered the DB2 market because he sees great opportunities in the systems software market. "There are opportunities for financial gain and opportunities to build a company," Goldsmith observed.

"The key is finding a good niche in which you can operate. We feel DB2 represents an opportunity niche for us," he added.

DB2 has an installed base of more than 1,000, the developer said, "so there is strong evidence that there will be a large user community" for DB/Pro Edit.

Goldsmith said the installed base for DB/Pro Edit is currently 19. The installed base for the Single Image Software series is approximately 1,000, according to a spokeswoman at Duquesne Systems, Inc. in Pittsburgh, which purchased that product from CGA. Top Secret currently has a worldwide installed base of 2,200, said a spokeswoman at Computer Associates International, Inc. of Garden City, N.Y., which purchased that product from CGA.

Top Secret "really was a great product," Goldsmith said. "In some respects, you have the advantage being the second or third one in the market. You can see what the other person did." He said that with Top Secret, CGA took an entirely different approach to the software's security system than did IBM with its Resource Access Control Facility, "and it turns out that that's what the users wanted."



Uccel to exploit emerging IBM VSE/VM mart

BY CHARLES BABCOCK
CW STAFF

DALLAS — Uccel Corp. is offering a system utility for what it sees as an emerging market of customers who use the IBM VSE operating system as a guest under VM.

Uccel's VSE Systems business unit in Boston has brought out a $22,500 package called Tape/Manager VM-VSE. The software performs tape-drive management and tape-volume control functions typical of tape-management products in the IBM MVS and VM environments.

VSE Systems general manager Donald L. Sullivan, citing figures from Focus Research Systems of West Hartford, Conn., said 25% to 26% of all DOS/VSE sites also have VM. For Uccel's customer base, the percentage is closer to 40%, he said.

"VM was supposed to be a bridge to MVS. But VM has so much flexibility that some companies in the VSE world are turning to VM instead of MVS. That is something that IBM didn't fully anticipate when it brought VM out," Sullivan said.

With the Uccel product, a VM/VSE user can use VM tape drives rather than dedicated VSE tape drives. A central catalog allows systems operators to control both VSE and VM tape files and volumes, Sullivan added.

The VSE Systems business unit, formerly Corodale, Inc., which was acquired by Uccel in 1985, produces a line of VSE utilities, including Space/Manager, a disk-file space-management tool, and System/Scheduler, a production work load organizer. The unit plans to convert additional utilities for use in the VM environment, Sullivan said.

Digital has it now



The one thing [illegible] do with [illegible] is change. Therefore, the most challenging [illegible] is how to meet needs you can't always [illegible].

Digital [illegible] architecture that is so flexible, it can satisfy your [illegible] demands from the desktop to the [illegible]. All use the same huge range of applications, [illegible] files, the same [illegible] commands. Throughout the department, [illegible] storage devices and applications can be cost-effectively added [illegible] reallocated without disrupting users. Systems can even



One Architecture. A consistent approach to computing for all your department's changing needs.

be clustered for greater power, capacity and redundancy. Transparent communications built on the same architecture let you tie our computers to each other and to multi-vendor environments. And because of our superior networking technology, you can also connect peer-to-peer in both local and wide area networks.

Best of all, with one architecture you're always in control–no matter how things change. Call your local Digital sales office. Or write: Digital Equipment Corporation, 200 Baker Ave., West Concord, MA 01742.

digital™

© Digital Equipment Corporation 1987. The Digital logo and VAX are trademarks of Digital Equipment Corporation.

Take the Multi and run.



NEC

C&C Computers and Communications





NEW PRODUCTS

Systems software

Software Architecture and Engineering, Inc. has ported its **Knowledge Engineering System** to the IBM Mainframe OS-MVS environment.

The Knowledge Engineering System is said to be a group of software tools designed to help users develop, implement and support artificial intelligence expert systems. The vendor claimed expert systems built with this software can be directly embedded in other software. Choice of inferencing techniques include production rules, hypothesize and test and statistical reasoning.

Prices for the Knowledge Engineering System on IBM mainframes range from $6,000 on the 4331 to $30,000 on the 3090.

Software Architecture and Engineering, Suite 500, 1600 Wilson Blvd., Arlington, Va. 22209.

Applications packages

Rehmann, Robson & Co. has enhanced its **Fixed Asset Control One** (FACO) software.

FACO is a depreciation software package that runs on IBM's System/34, 36 and 38.

New features include multiple company or entity support within an installation; assets entered onto one screen for inclusion in up to four schedules; data entry online, with interactive editing; 12 additional reports; and accommodations for the Tax Reform Act of 1986.

The Fixed Asset Control One for the System/38 costs $5,000 per CPU. It costs $2,500 per CPU for the System/34 and 36.

Rehmann, Robson & Co., P.O. Box 2025, Saginaw, Mich. 48605.

Lee Blue & Associates has announced **Contact Organizer**, a software product designed to run on IBM's System/34 or 36.

The software is said to allow users to record, organize and retrieve information on customers, sales representatives and other business and personal contacts. Contacts are grouped by type.

A notepad function allows up to 20 pages of comments and notes to be included with each contact record, according to the vendor.

Other features include a search capacity, variable sort and select, phone directory, one-time labels, multiple file environments, multiple label sizes and documentation.

The Contact Organizer costs $695.

Lee Blue & Associates, 11910 44th Ave. N., Plymouth, Minn. 55442.

Utilities

Blueline Software, Inc. has introduced **Multiterm/SNA**, a VTAM multisession manager for users of IBM's DOS/VSE operating system running either as a stand-alone or as a guest under IBM's VM.

The software is said to allow the user to be logged on the several VTAM applications at once and to switch between them instantly via a menu or a toggle key. Users may define their own custom menus or use the menu system provided by Multiterm/SNA. Other features include dynamic profile editing and multiple CPU network support.

Multiterm/SNA operates as a VTAM application. A site license costs $10,795. It is also available in combination with the vendor's Multiterm VM product.

Blueline Software, Suite 340, 1500 S. Lilac Drive, Minneapolis, Minn. 55416.

Archimedes Software, Inc. has announced **C cross compilers** for the Motorola, Inc. 68HC11, Hitachi Ltd. 6301 and Motorola 6801 microcontroller families.

The kits include a C compiler and C library functions, a macro assembler, linker and librarian.

The compilers are hosted on personal computers and Digital Equipment Corp. Microvax and VAX systems, the vendor said.

The compilers implement the proposed American National Standards Institute's C language enhancements, according to the vendor.

They are also said to support IEEE 32-bit, single-precision, floating-point library functions.

Mathematical support includes trigonometric, logarithmic and exponential functions.

The personal computer, Microvax and VAX versions cost $995, $3,995 and $4,995, respectively.

Archimedes Software, 1728 Union St., San Francisco, Calif. 94123.

Data Translation, Inc. has introduced the **DT-Iris** subroutine library. DT-Iris is intended for use with the Digital Equipment Corp. Microvax II.

The software is said to provide access to image processing functions.

According to the vendor, DT-Iris takes control of system-service calls, memory mapping and all management of virtual memory.

The program also assumes responsibility for controlling the specialized frame grabber and frame-processor peripherals, the vendor said.

Functions include windowing, frame averaging, zoom, pan, scroll, logic operations, cursor manipulation, image acquisition and reduction, buffer allocation and disk storage.

DT-Iris costs $1,995.

Data Translation, 100 Locke Drive, Marlboro, Mass. 01752.

Data base management systems

Sun Microsystems, Inc. has announced **Version 5.0** of **Suningres**, which is the firm's relational data base management system.

Enhancements include capabilities that allow users to share data bases across IBM's SQL and a network of computers and operating systems from different vendors.

The Suningres/Net networking software package included with Suningres 5.0 is said to connect different systems or to connect any system with Relational Technology, Inc.'s Ingres/Net networking implementation.

Suningres Release 5.0 is priced at $3,990.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.



Brings the Classroom to the Office

- No travel time or expense
- Self-paced
- Hands-on exercises
- Always ready for review or new staff

Developed by experts in designing and implementing UNIX/XENIX systems, as well as in teaching UNIX/XENIX & 'C'.

Courses include:*
UNIX Executive Perspective
UNIX Overview
UNIX Fundamentals for Programmers
vi Editor
UNIX Shell
'C' Language Programming

See for yourself how Video-Based Training can benefit your organization. (Also ask about our PC applications video-based courses.)

For Your Free Demonstration Package, or 48-page courseware catalog, call (800) 323-8649 or (312) 987-4084

COMPUTER TECHNOLOGY GROUP
Video Skills, Inc.
310 S. Michigan Ave.
Chicago, IL 60604
In Europe:
Bush House, 72 Prince St.
Bristol BS1 4HU

UNIX® is a registered trademark of AT&T.
**XENIX is a trademark of Microsoft

*Public and on-site seminars also available on these and additional UNIX & 'C' subjects.

COMMUNICATION NETWORKS '87

Conference sessions now available on audio and video cassettes.

You can choose from more than 80 audio taped and 10 video taped CN'87 conference sessions. Timely topics are presented by the leading authorities in telecommunications — Dixon Doll, John McQuillan, Harry Newton and Howard Frank.

To receive prices and a complete listing of available cassettes simply fill out the coupon and mail it to: CN '87 Tape Center, Communication Networks, P.O. Box 9171, Framingham, MA 01701-9171.

Yes, I'm interested in receiving information on Communication Networks '87 audio/video tapes.

Name _____
Title _____
Company: _____
Address: _____
City/State/Zip: _____
Telephone ( ) _____

CW



WITHOUT DATA GENERAL INTEGRATING YOUR COMPUTERS IS LIKE PITTING MAN AGAINST MACHINE.

DATA GENERAL GIVES YOU THE BEST SOLUTIONS FOR COMPUTER INTEGRATED MANUFACTURING SYSTEMS.

Are the levels of your manufacturing operation locked in hand to hand combat? Our total integration solutions can make them all work together. Hand in hand.

The full range of our computers and solutions spans key areas. So engineering can tie in with manufacturing. Planning and control can communicate with sales and administration.

We give you advanced productivity solutions. With TEO,™ our technical automation system. And with CEO,® our business automation system. Each further streamlines your operations when they're combined with major CIM applications.

Data General is firmly committed to industry communications standards. Like MAP, SNA, X.25 and Ethernet.® They give you even more flexibility. And help you forge different systems into a single information mainstream.

What's more, our MV/Family computers are price/performance leaders. Which makes these solutions more affordable.

Our global support team can mold manufacturing solutions to fit almost any need. Whether it be production of steam turbines. Or manufacturing paper products. Companies wrestling with today's complex manufacturing needs have discovered integrated solutions from Data General.

To find out more, call 1-800-DATAGEN (in Canada call 1-800-268-5454). Or write: Data General, 4400 Computer Drive, MS C-228, Westboro, MA 01580.



Data General
a Generation ahead.

© 1986 Data General Corporation. TEO is a trademark and CEO is a registered trademark of Data General Corporation. Ethernet is a registered trademark of Xerox Corporation.

The SAS® System

Power Behind Every Window.

If you're "window shopping" for software that's both powerful and easy to use, take a look at the SAS® System for Personal Computers. It's got everything you're looking for...and more.

1 Ease of use. The SAS System has ready-to-use procedures for every kind of analysis and report—from simple to advanced, preformatted to customized. There's even a built-in menu system to guide you through the procedures, and on-line help is always available. Special windows let you define titles and footnotes for reports, check the characteristics of your data, change function key definitions, and keep notes.



2 Connectivity. With the SAS System for personal computers, you get a built-in link to your host SAS System. You can download corporate data; develop, test, and run applications on your PC; or move data and applications back to the host for execution. Plus the SAS System reads data from any kind of file, including dBASEII,® dBASEIII,® and Lotus® 1-2-3.®



3 Integration. The SAS System runs on mainframes, minicomputers, and personal computers. The language and the syntax are the same. The full-screen text editor is the same. You only have to learn one software system no matter what hardware your company has installed:



4 Expandability. As your needs grow, the SAS System grows with you. We're committed to supporting all the capabilities of our mainframe software system for your PC. Whether you license one product or several, you'll enjoy the same high-quality software, training, documentation, and support we've offered for 10 years. It's all part of our site licensing plan.



Call or write us today.

SAS Institute Inc.
Box 8000 □ SAS Circle
Cary, NC 27511-8000
Phone (919) 467-8000 □ Fax (919) 469-3737

The SAS System runs on the IBM PC XT and AT, IBM 370/30xx/43xx and compatible machines, Digital Equipment Corporation's VAX™ and MicroVAX II,™ Data General Corporation's ECLIPSE® MV series, and Prime Computer, Inc.'s 50 series. Not all products are available for all operating systems.

SAS is the registered trademark of SAS Institute Inc., Cary, NC, USA. dBASEII and dBASEIII are registered trademarks of Ashton-Tate. Lotus and 1-2-3 are registered trademarks of Lotus Development Corp. Copyright © 1986 by SAS Institute Inc. Printed in the USA.

SMALL TALK



William Zachmann

Innovative commodities

It has become trendy for manufacturers of personal computers and related hardware to disdain commodity products. There are two implicit premises behind this disdain. The first is that commodity products are necessarily low-margin products because of relatively low barriers to entry in the market and the intense competition that results from their entrances.

Second, it is implied that commodity products are necessarily imitative. They are compared with supposedly more innovative products that add value to what is already available in the marketplace.

Wyse Technology, Inc., headquartered in San Jose, Calif., has long been delivering practical examples of the inaccuracy of these two assumptions. Entering supposedly saturated commodity markets for ASCII and American National Standards Institute (ANSI) terminals several years ago, Wyse was a spectacular success, achieving impressive market share

Continued on page 30

Package helps economic forecasts

BY DAVID BRIGHT
CW STAFF

A number of businessmen have been using an IBM Personal Computer statistical software package called Forecast Master to speed the creation of a broad range of economic predictions, sometimes involving hundreds of variables.

Users of the package, which was introduced two years ago by Scientific Systems, Inc. in Cambridge, Mass., include utility companies, telecommunications firms, financial institutions, colleges and government agencies.

The $595 package consists of seven modules for manipulating economics-related statistics: State Space, Box-Jenkins, Bayesian vector autoregression, Auto-Pro regression, seasonal decomposition, exponential smoothing and curve fitting. A mathematics background is required to properly use the program, users say.

About 3½ years ago, Jack Malehorn started using Lotus Development Corp.'s 1-2-3 in conjunction with State Space — a precursor to Forecast Master — to forecast interest rates and loan volumes for an agricultural bank. It was a very important part of his job, he says.

Later, when Malehorn accepted a job as an economist with United Telephone System, Inc.'s Eastern Group in Carlisle, Pa., he was relieved to hear that he had the freedom to choose his tools. He promptly acquired an IBM PC XT and Forecast Master.

Malehorn's job is to predict what impact local economies will have on his company's operations. He says Forecast Master helps him more easily understand, describe and analyze the local economies. He has built several econometric models, each with over 100 variables, and says the tool box nature of the program enables it to handle just about any task.

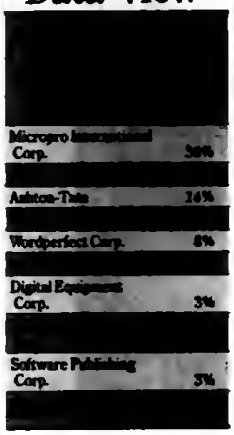
Variables to be input include real investment in residential and nonresidential construction, building permits, housing starts, retail sales, new car registrations and telephone use. Lotus's 1-2-3 is used to store the data.

While Malehorn is not able to estimate the time or money savings achieved with Forecast Master, he claims his job would be "pretty difficult" without it.

Another positive user is Steve Scarborough, administrator of the economic analysis division at the Texas Department of Human Services in Austin. The division is responsible for setting rates that the state will pay for medical and other services. Scarborough says he is impressed by the package's wide range of forecasting ability. He uses the package to forecast welfare case loads and the state's costs relating to services for each eligible person. Ashton-Tate's Framework II and Dbase III Plus packages are used to

Continued on page 31

Data View



Lotus readies Jazz successor for Mac

BY DAVID BRIGHT
CW STAFF

LOS ANGELES — Two years after the introduction of its less-than-popular Jazz integrated package for Apple Computer, Inc.'s Macintosh, Lotus Development Corp. says it is taking the Macintosh market more seriously. To demonstrate its "renewed commitment" to the Macintosh, Lotus plans to preview the successor to Jazz at the Appleworld exposition here this week.

Code-named Galaxy, the package will run on the Macintosh Plus as well as the two more powerful Macintosh systems scheduled to be introduced at the show. Galaxy will not run on the 512K-byte version of the Macintosh. Lotus said last week it plans to formally introduce the product and begin shipments in early summer, but the company has yet to reveal its pricing and upgrade strategy.

According to Lotus officials, the difference between what Macintosh users and IBM Personal Computer users want is lessening. "We've learned a lot since we introduced Jazz in 1985," product marketing manager Pamela Campagna said. What Lotus has learned, she added, is that users want power, performance and programmability in their integrated packages.

With Galaxy, Lotus has made a faster spreadsheet, deepened each of the link modules and added a command language and a forms module, Campagna said. A drawback of Jazz has been its lack of macro support. Microsoft

Continued on page 31

Inside

- **Executive Technologies offers Searchexpress document storage and retrieval software. Page 31.**
- **Network Technologies' introduces hand-held generator to test the IBM Color Graphics Display. Page 34.**

CAN YOUR PC DBMS SOLVE THIS AS EASILY AS ORACLE?

QUESTION:

WHO EARNS MORE THAN THE AVERAGE SALARY OF PEOPLE WITH THE SAME JOB?

Most PC database software is adequate for simple file management. But only PC ORACLE® can solve the most complex database problems with ease. Like the question posed above. A single ORACLE command with a recursive, nested join gives you the answer.

We designed ORACLE from the ground up to handle tough, mainframe-class problems. By extending IBM's mainframe language SQL. And by creating a comprehensive array of fourth-generation tools for reporting and application development.

Like Easy*SQL™ So even a novice PC user can master SQL in minutes. Through pop-up windows, context-sensitive help, and point-and-select menus.

And SQL*Calc™ The 1-2-3-like spreadsheet that marries the world's most popular PC user interface with the world's most powerful PC DBMS.

In addition, ORACLE gives you three compelling reasons to make it your PC DBMS of choice.

1 Compatibility with both ANSI-standard and IBM standard SQL. So you can develop applications in PC ORACLE and run them on the largest IBM mainframe under DB2 or SQL/DS.

2 Portability. ORACLE under PC/MS-DOS is identical to ORACLE under VM, MVS, VAX/VMS, UNIX, and other operating systems. So your PC ORACLE applications are automatically portable to over 50 minicomputer and mainframe families.

3 Connectability. All implementations of ORACLE can be networked together. So you can access and update ORACLE databases on other computers right from your desktop PC.

Discover why thousands are already using PC ORACLE. And have made Oracle Corporation the fastest growing software company in the world.

For more information, or to order your copy of PC ORACLE, call toll free **1-800-345-DBMS** today. We honor major credit cards, checks, and corporate POs.

ORACLE®

Compatibility • Portability • Connectability

20 Davis Drive, Belmont, CA 94002

Innovative

CONTINUED FROM PAGE 29

growth in the tough market.

Wyse, in its terminal business, effectively demolished the conventional assumptions about commodity markets. Wyse's terminal products drove home the point that innovation in procurement and production management can be just as important as innovation in product design.

Wyse's success in terminals rested on the ability to buy and build better, faster and less expensively than the competition, even when the competition was bigger and had supposed initial economies of scale in its favor. At the same time, however, Wyse also managed to offer products with superior individual features and capabilities.

Innovative tools

It should come as no surprise to those who have followed Wyse's successes in the terminal market, therefore, that the company's movement into the personal computer market should be marked by products delivering substantial value at highly competitive prices. The WysePC 286 and the WY-700 high-resolution display monitor are not only competitive products but also significantly innovative.

The WysePC 286 is a highly compatible alternative to the IBM Personal Computer AT. But it is also a well-engineered, high-speed (9.54 MHz) system that runs circles around the standard product.

At a reduced list price of $3,699 — with 640K bytes of memory, built-in clock, two serial ports and one parallel port, a 1.2M-byte floppy and a 40M-byte hard disk — the WysePC 286 offers reliable high performance at an attractive price. It comes with a one-year warranty.

While no radical departure, the WysePC 286 is more that just a fast PC AT compatible. Well designed throughout, it has many low-key features that distinguish it. The front-panel switch selectability between the standard 4.77-MHz and the higher speed 9.54-MHz modes, for example, can be used at almost any time with a much wider range of software than similar options I have seen with most other systems.

Little touches, like an easily detachable cover for the cable connections at the back of the unit, demonstrate intelligent thoughtfulness about design details that are not commonly found in similar systems. With the WysePC 286, you get a distinct feeling that you are dealing with a system that easily plays BMW to IBM's Cadillac at Honda prices.

Impressive as the WysePC 286 may be, however, the WY-700 monitor display is even more convincing evidence of Wyse's ability to combine efficient low-cost manufacturing with product innovation. Handily complementing the processing speed of the WysePC 286, the WY-700 provides monochrome graphics of up to 1,280- by 800-dot resolution for only $999, which includes the graphics controller board.

The WY-700 makes it easy to obtain high-resolution monochrome graphics at a very low cost. It be used with any PC AT-compatible system. In addition to providing high-resolution black-and-white graphics, it also can emulate the IBM Color Graphics Adapter with four shades of gray.

The WY-700 and adapter card is an economical IBM PC-compatible desktop publishing and computer-aided design and manufacturing application. More than that, however, it is a practical option for a wide range of business-oriented personal computing applications.

The WY-700 requires software drivers specific to it to be used fully. Standard text modes, however, allow up to 50 lines with 160 characters each, provided that application software is able to handle these sizes.

Individually or together, the WysePC 286 and the WY-700 monitor are testimonials to the positive impact of highly competitive markets.

They clearly show how competition encourages innovation in ways to lower the cost of manufacturing as well as make a product better.

Limitations

Two relatively minor limitations of the WY-700 should be noted. First, the interlaced scan on the monitor does seem to create a slight, almost imperceptible flicker to the image. This is more noticeable at the edges of the screen than at the center. The flicker, however, will be no more than a minor matter for most users, if it is noticed at all.

Second, the brightness and contrast of the WY-700 could be a bit crisper. At least on the unit evaluated, the readability of the screen in the high-resolution graphic mode in a brightly lit room was not quite as good as I would have liked.

These considerations are minor, however, compared with the overall function and value of the WY-700. Both the WY-700 and the WysePC 286 deliver substantial value at attractive prices.

Together, the fast system and the high-resolution monitor unquestionably provide a practical platform on which to develop a wide range of critical applications for a growing number of users. Separately or together, the WysePC 286 and the WY-700 help show the limitations of overly simple assumptions about innovation and supposed commodity markets.

Zachmann is vice-president of research at International Data Corp.

Instant Gratification



Announcing the Canaan DCS 6000™ Series

The Only Affordable 370-Based Superminimainframe That Outperforms IBM's 9373 Is Available Now.

- Features a price/performance advantage of 30-50% over IBM's 9373
- Offers the lowest price, most powerful entry system for the multi-user 370 environment
- Based on Canaan's proven technology, installed in many Fortune 200 companies since 1983
- Runs standard mainframe VM software packages, like PROFS™, FOCUS, RAMIS® Information System, NOMAD2™ and SAS® as well as CICS COBOL applications
- Requires no special cooling, plugs into standard wall outlets, and starts (IPL) with the push of a single button
- Attractive, desk-height, quieter than PCs
- Available now

Call Canaan Now For Quick Delivery!
1-800-382-4100

CANAAN

Canaan Computer Corporation 39 Lindeman Drive Trumbull, CT 06611 (203) 372-8100

Storage tools let users work with magnetic, optical media

BY DOUGLAS BARNEY
CW STAFF

BIRMINGHAM, Ala. — Executive Technologies, Inc. recently announced the Searchexpress product series, a line of document storage and retrieval software.

The $199 Searchexpress 1.00 package provides text retrieval from magnetic media only. Searchexpress 2.00 allows the user to store and retrieve documents on both magnetic and optical media.

"It allows the businessman to store all of the textual information that comes across his desk for future retrieval," said James L. Geer, president of Executive Technologies. "It is like having a photographic memory."

The packages feature windows, pull-down menus and what-you-see-is-what-you-get capability. The current products provide full Boolean search capabilities as well as simple word search. Users can also search and retrieve documents through word rooting, save and restore search requests and search for only recently added documents or similar documents.
for optical media.

A displayed document can be viewed as a whole, or the user can zoom in to paragraphs or sentences containing key words.

Geer said the growth of high-capacity magnetic and optical storage, along with the advent of low-cost optical scanners, has made document storage possible.

Executive Technologies' next move, Geer said, will be into image storage and retrieval.

The Searchexpress family runs on IBM and compatible personal computers and requires 427K bytes of random-access memory. Searchexpress 2.00 for magnetic media sells for $349 and $549 for optical media.

Package

CONTINUED FROM PAGE 29

store the data on an IBM PC AT with a hard disk. Forecast Master correlates variables such as hospital in-patient dollars per claim with external variables like cost of living.

Scarborough suggests that Scientific Systems expand the manual and on-line Help facility and also upgrade the Box-Jenkins module to better compete with Auto Box, a specialized package from Automatic Forecasting Systems, Inc.

Both Malehorn and Scarborough stress that a math background and a math coprocessor are essential to the efficient operation of Forecast Master.

Lotus

CONINUED FROM PAGE 29

Corp.'s competitive Excel program for the Macintosh and Lotus's IBM PC-based 1-2-3 and Symphony all accept macro commands.

Galaxy's command language goes beyond macros to encompass the spirit of Symphony's command language, systems architect Adam Hertz said.

The six modules for handling various functions can be used separately or in an integrated fashion. In addition to being faster, spreadsheet models under Galaxy can be linked together and can look up information in other models.

Using the communications module, 1-2-3 and Symphony files can be directly imported into Galaxy without the translation step required with Jazz. The module also provides IBM 3270 emulation support for mainframe access, according to Lotus.

AMHERST INFORMATION SYSTEMS

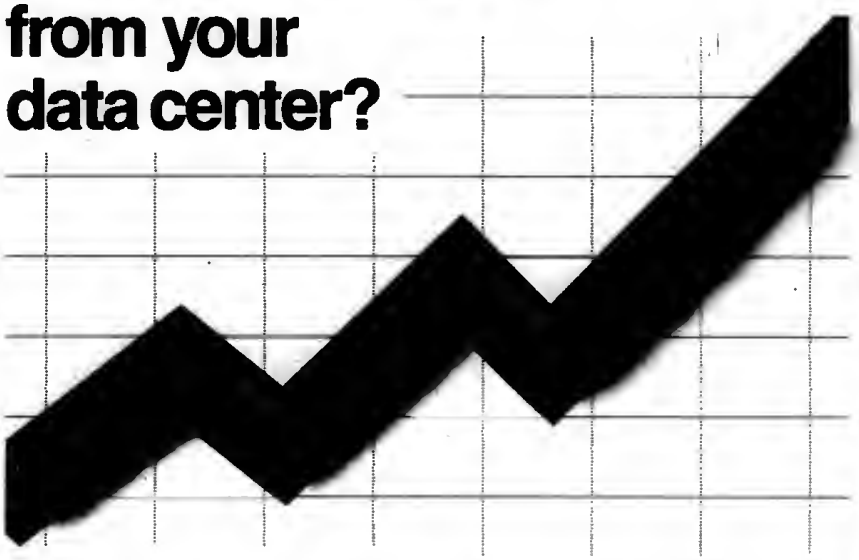
***** DB2 SERVICES *****

- DB2 Installation and Planning
- DB2 System Administration
- DB2 Training
- DB2 Performance and Tuning
- DB2 Standards and Procedures

Amherst Information Systems
86 Larkspur Dr, Suite 315
Amherst, MA 01002 (413) 549-7131

National Advanced Systems

Are you getting peak performance from your data center?



Because you're a peak performer, you demand peak performance from your data center. That's why National Advanced Systems is the mainframe and storage systems company you need. To provide the utmost system response, capacity, and availability. To produce tangible results from your information processing investments. To propel your most ambitious business plans into reality.

Our mainframes, storage systems, and service and support are all geared to serve major users of information processing equipment around the world. Companies such as Electronic Data Systems Corporation, Baxter Travenol, The Goodyear Tire & Rubber Company, Southeast Bank, N.A., Rand McNally & Company, and many others. Peak performers like yourself.

Our products are renowned for quality and reliability unsurpassed in the IBM-compatible environment. We add to this exceptional value with a very simple feature. We listen. We work closely with you to provide innovative solutions that meet your unique requirements. We back up these solutions with the top-ranked service and support in the industry.

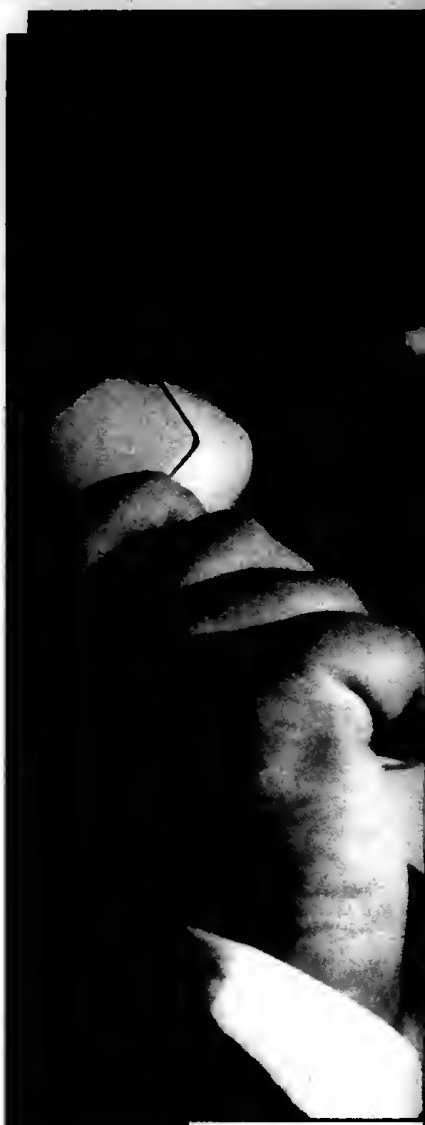
Our customers buy our products because they perform. They keep them because we perform. To get peak performance from your data center, write John Diedenhofen, Vice President of Marketing, National Advanced Systems, MS 52, P.O. Box 7300, Mountain View, CA 94039. Or, call 415-962-6100.

The preferred choice of informed mainframe and storage systems users around the world

Data processing can be
a pretty ugly business.



"How come my month-end
budget figures are always
a month behind?"



"Does my dep
to shut down e
mainframe g

We've got one beautiful solution to three of your ugliest problems.

Get all the ugly details.

Show me how the Courier Departmental Processor can bring out the true beauty of my 3270 system. Send more information to my address below. Or call, (800) 528-1400, ext. 7225.

Name

Company Name

Address

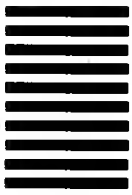
City State Zip

ITT COURIER





NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 6164 PHOENIX, ARIZONA

POSTAGE WILL BE PAID BY ADDRESSEE

ITT Courier Terminal Systems
Mail Stop A14
P.O. Box 29039
Phoenix, Arizona 85038-9990





artment have
very time your
ets tied up?"



"Why is it this dumb terminal can't do simple wordprocessing?"



The Courier Departmental Processor brings out the true beauty of your 3270 system.

The problems of the 3270 world can make even the ablest DP manager look bad. That's what's so beautiful about the Courier Departmental Processor.

It fits neatly into the 3270 system you've already established. Yet it distributes local processing relief to some of your biggest, ugliest headaches.

For the upper-management types breathing down your neck for month-end figures, it gives functional and regional departments the processing power to crunch numbers on a schedule everyone can live with.

For branch managers who can't get enough of your mainframe, it provides a localized database without cutting the cord to your 3270 system.

And for those users that can't seem to get the work out, it turns your Courier 9000 Series terminals or other work stations into productivity powerhouses — capable of spreadsheets, word processing, networking and an unlimited number of customized local functions.

All in all, this beauty can make you and your 3270 system look better than ever. And it's surprisingly easy to come by.

Just contact Courier today for more information. We'll put together an attractive package you just can't find anywhere else.

ITT
COURIER

NEW PRODUCTS

Software applications packages

The **Thoroughbred Division** of Concept Omega Corp. has announced **Thoroughbred Idol-II**, a relational data base management and retrieval system.

Designed for use in the Thoroughbred Basic multiuser environment, the software features free-form on-screen editing, windows, context-sensitive Help and free-form text fields. It also incorporates a multirecord data management capability allowing users to view and edit multiple file records simultaneously.

Idol-II is priced from $795 to $3,895.

Thoroughbred, P.O. Box 1035, 102 Old Camplain Road, Somerville, N.J. 08876.

Software utilities

Sapiens Software Corp. has announced **Sapiens Make**, a maintenance utility said to be fully compatible with Unix Make.

Make is a utility that maintains modular program source code. It uses make files, which the programmer writes, to construct dependency rules.

According to the vendor, make files can be taken straight from a Digital Equipment Corp. VAX running University of California at Berkeley Unix 4.2 or from an IBM Personal Computer AT running Unix System V.

Sapiens Make is priced at $79.

Sapiens Software, P.O. Box 7720, Santa Cruz, Calif. 95061.

Development tools

Skylight Software, Inc. has announced **Handprints**, a software tool said to allow handprinted character input for IBM Personal Computers.

Handprints is said to enable programmers to incorporate the character-recognition capability into applications. The software is an implementation of the advanced, on-line, handprinted character-recognition algorithm. Extraction methodology is used to extract descriptive features of the character shape.

Handprints can handle handprinted letters, digits and some special characters and mathematical symbols.

Handprints is priced at $1,200, including the Mitsubishi Corp. Grafnet tablet.

Skylight Software, 2 Charles St., Bedford, Mass. 01730.

Software enhancements

Magee Enterprises has announced **Version 4.0** of its **Automenu** software management system.

Version 4.0 allows users of IBM Personal Computers and compatibles to set up a menu system that can directly execute IBM PC-DOS commands.

Features include capabilities for organizing all programs into one menu system, on-screen Help and the ability to execute commands at a preselected time.

Automenu costs $46. Current registered users of earlier versions can upgrade for $20.

Magee Enterprises, 6577 Peachtree Industrial Blvd., Norcross, Ga. 30092.

Data Storage

Sysgen, Inc. has introduced the **Smart Image-60**, a cassette-tape backup subsystem for the IBM Personal Computer XT and AT.

The Image-60 is said to offer 60M bytes of storage. It features dual read/write heads for one-pass data verification, a dedicated controller and Sysgen's proprietary automatic backup software.

The Smart software can be set to back up only those files that have changed, so there is no need to change tapes for every backup, the vendor said.

The Smart Image-60 is priced at $895.

Sysgen, 47853 Warm Springs Blvd., Fremont, Calif. 94539.

Board-level devices

Levco has unveiled its **Prodigy Prime** enhancement board for the Apple Computer, Inc. Macintosh.

The basic configuration of the Prodigy Prime board is said to feature a 16-MHz Motorola, Inc. 68020 CPU, 1M byte of random-access memory expandable to 32M bytes, an internal fan and an additional power supply.

The Prodigy Prime board costs $1,195.

The vendor also announced a price reduction for its Prodigy 4 enhancement board for the Macintosh to $4,995.

Levco, Suite C-203, 6160 Lusk Blvd., San Diego, Calif. 92121.

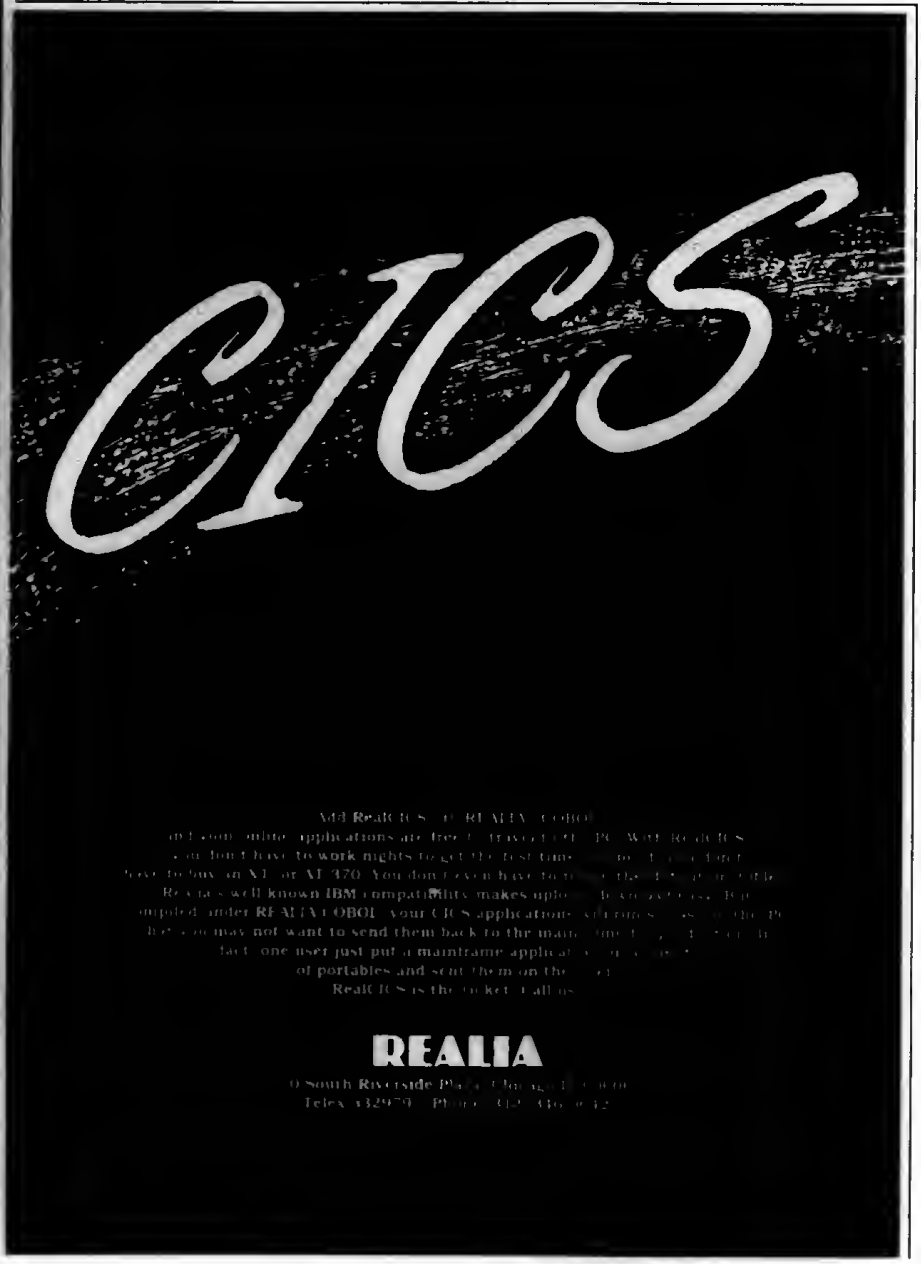
Auxiliary equipment

Network Technologies, Inc. has announced the **Montest-15K** portable video generator for testing the IBM Color Graphics Display.

The hand-held unit is said to generate four different patterns, including color bars, cross-hatch, window and full raster, with up to 16 different color and intensity options. It also generates reverse video, the vendor said.

The Montest-15K is priced at $199.95.

Network Technologies, 19145 Elizabeth St., Aurora, Ohio 44202.



NETWORKING

ISDN terminals come to market

AT&T admits use limited until local exchange carriers deliver services

BY ELISABETH HORWITT
CW STAFF

INDIANAPOLIS — AT&T Network Systems recently announced the commercial availability of a wide range of Integrated Services Digital Network (ISDN) terminals, admitting that these products will be of limited use until the long-awaited ISDN services arrive.

AT&T's voice, data and voice/data terminals, which were announced at the recent U.S. Telecommunications Association's Eastern Telecommunications Showcase, were designed to communicate with an AT&T 5ESS digital switch running AT&T's ISDN software. Large companies can now install their own private ISDN networks, made up of the new workstations and a 5ESS switch, which has the capacity of a top-of-the-line AT&T System 85 private branch exchange, according to AT&T spokeswoman Susan Fleming.

The majority of customers, however, will have to wait for the divested operating companies to install sufficient AT&T 5ESS switches to support ISDN services, she added. "You can buy the terminals today, but then you have to wait for your local exchange carrier to install ISDN switches." Currently, the only AT&T ISDN switch is installed at Illinois Bell's Oak Brook, Ill., central office, which is being used in the McDonald's Corp. ISDN trial initiated late last year. The terminals are also being used in the trial.

'Not nailed down yet'

AT&T's ISDN workstations will not work with other types of ISDN central office switches, such as Northern Telecom, Inc.'s DMS-100, according to Fleming. "Northern Telecom, like AT&T, did what was necessary to implement the existing standard," but each company incorporated its own protocols for those aspects of ISDN that are "not nailed down yet," Fleming said. "ISDN has not yet reached the point where everything will work with everything."

Northern Telecom research and development subsidiary Bell Northern Research recently announced call management software that enables an IBM Personal Computer and telephone set to share an ISDN Basic Rate interface to a DMS-100 ISDN switch.

The terminals do not work with AT&T's recently announced Enhanced System/86 private branch exchange, which supports the ISDN primary interface. AT&T is "working on it," Fleming said.

ISDN offerings announced by AT&T include:

- The ISDN 7505 Modular Terminal, a voice terminal with optional Asynchronous Data Module that supports asynchronous data transmission at rates of up to 19.2K bit/sec.
- The ISDN 7514 Voice/Data Terminal, which supports simul-

Continued on page 38

DEC may add Netbios interface

BY CHARLES BROWN
and JANE LAWRENCE
SPECIAL TO CW

LONDON — Users could see improved connectivity between Digital Equipment Corp.'s Decnet and networks based on IBM's Netbios before the end of this year, according to DEC's Charles Monk, product manager for the Vaxmate here. Monk says the company may include Netbios in Version 2 of Decnet DOS, which is due for release this fall.

"It's not a certainty, but it is very possible," he maintains.

While users have been able to integrate Vaxmate workstations and other VAX products into combined networks, the absence of a DEC Netbios interface in Decnet DOS currently limits the transparency of the network, particularly when it comes to running software that requires full compatibility. One major British user, Alistair Banks, project leader with Midland Bank Group, says he regards the lack of Netbios as a serious omission in an otherwise good product.

Heavily reliant on flexible and high-powered computer sys-

Continued on page 38

X.25 bridges Novell LANs

BY DONNA RAIMONDI
CW STAFF

IRVINE, Calif.— Gateway Communications, Inc. has released a remote bridge for Novell, Inc.'s Netware local-area networks (LAN).

G/Remote Bridge is a generic, high-speed X.25-based Netware LAN-to-LAN remote bridge. It supports all Netware communications protocols applications and is available to more than 37 different types of networks from major LAN suppliers.

The product looks like a step forward for personal computer LANs, according to David Terrie, editor of Patricia Seybold's newsletter, "Network Monitor." "More typically, you have

Continued on page 38

Rolm lets Phonemail talk

BY ELISABETH HORWITT
CW STAFF

SANTA CLARA, Calif. — Rolm Corp. recently announced the Phonemail Network, which allows users on geographically dispersed Phonemail systems to exchange voice messages.

Rolm also announced Phonemail integration for Centrex systems and enhancements to Phonemail systems that support non-Rolm private branch exchange (PBX) systems.

The Phonemail Network option provides the capability of forwarding and answering calls across multiple Phonemail nodes, and lets users set up a distribution list that automatically forwards the same message to multiple mailboxes residing on different Phonemail systems, Rolm product manager associate Amy Beringer said.

The Network sends voice messages over existing dedicated or public analog lines. A line-quality testing feature ensures that noise, harmonic distortion, frequency and amplitude levels are acceptable each time a message is sent, Rolm claimed.

Systems link

A required component of the network is the Enhanced Voice Processor, which sends error checking, destination-header and calling-party information on the link between Phonemail systems.

Rolm also introduced fuller integration between Phonemail and 1AESS Centrex and non-Rolm PBX systems, Beringer said.

"Before, we interfaced with other vendors' systems; integration means features like automatic pickup of a call after it rings a certain number of times, the ability to provide specialized messages to callers, and call waiting messages," she explained.

Box replacement

The Phonemail-Telephony-Interface is an expansion card that fits into a Phonemail system replacing the more expensive Phonemail-PBX-Interface box.

Rolm also announced Phonemail security features, including unauthorized access notification and administrative reports.

Phonemail Network pricing starts at $1,000 per system. A Phonemail system including the Phonemail-Telephony-Interface starts at $47,000. Security features are included with Phonemail at no additional charge. Pricing for Phonemail integration for Centrex systems starts at $2,000. All of the products are scheduled for availability in the second quarter.

Inside

- **Tangent Technologies adds software tying IBM PC, Appleshare. Page 38.**
- **KMW Systems Auscom 8400 interfaces between IBM mainframe channels and VMEbus. Page 38.**
- **Corvus enhances its Omninet LAN. Page 39.**

Modems, Multiplexers, and Much More...

Warning: Bargains can be hazardous to your network.

Some people feel that price is the only thing that matters when it comes to modems. Our customers feel differently. If you also feel that quality, support and company stability are just as important as price, we offer you our 2400/1200 bps error-correcting MultiModems,™ in desktop, internal PC and rack-mounted versions.





And if your network is ready for multiplexing, we offer our MultiMux™ 4- and 8-channel statistical multiplexers.

MultiModems and MultiMuxes are manufactured in Minnesota by Multi-Tech Systems (as they have been since 1970), and provide exceptional quality at an economic price. If you are not already a Multi-Tech modem or mux user, please call us toll-free today, at

1-800-328-9717.

MultiTech Systems

Multi-Tech Systems, Inc. • 82 Second Avenue S.E. • New Brighton, MN 55112 • (612) 631-3550 • (800) 328-9717 • FAX 612-631-3575 • TWX 910-563-3610



If your business grows, can your

Your data processing needs may be growing faster than your systems



HP 3000 family. Micro 3000 XE, Series 52, 58, 70, 930 and, not shown: Micro 3000 and Series 950

can handle. A problem which we at Hewlett-Packard understand. A problem for which we designed a remarkable solution: the HP 3000 family of business computing systems.

These systems will meet your needs both now and in the future, without costly reinvestment in hardware, software and user training. They're fully compatible. And they give you a dramatic range of performance—both within the models and between them.

Start with any of the seven models: for instance, the just-introduced Micro 3000 XE. It lets you grow from 4 to 56 workstations and still maintain high performance. That's because it uses HP's advanced NMOS III VLSI technology. And, unlike most other micros, it has the same functionality as the rest of the family.



"What if...

we never stop asking

computers grow with you?

From there, you can expand effortlessly up to the top-of-the-line 900 series, which is based on next-generation HP Precision Architecture to provide mainframe-level performance. And HP can network these systems so you can grow to support thousands of users.

As you grow, you retain use of the same peripherals and terminals. Most upgrades can be accomplished in hours. There's no software conversion or rewriting. And you don't have to retrain any users.

The bottom line of all this is twofold: downtime is kept to a minimum, and you are making highly effective use of existing resources.

Consider also our record for quality and service; as well as our commitment to always asking "What if..." about your particular needs and problems. It all adds up to a convincing case for the Hewlett-Packard family of business computing systems.

If you'd like to learn more about how easily you and they can grow together, you can begin by calling 1 800 367-4772, Dept. 282W.

HEWLETT PACKARD

Business Computing Systems

Options designed for Appleshare

BY PATRICIA KEEFE
CW STAFF

HOUSTON — Kent Marsh Ltd. has introduced Foreground Manager, designed to allow Apple Computer, Inc.'s Appleshare file server to select more than one foreground program.

Foreground Manager is shipping now and carries an introductory price of $79.95 until June 1. Thereafter, it will sell for $110. It is available through Apple dealers.

ATLANTA — Tangent Technologies has announced PC Macbridge/AFP, software that allows IBM Personal Computers to access Apple's Appleshare file server. PC Macbridge/AFP is fully compatible with Apple's Appletalk Filing Protocol (AFP) and allows PCs to be integrated into the networked server environment.

PC Macbridge/AFP works with Apple's Appletalk PC card and within the Apple Communications Framework of integrating and enhancing Microsoft Corp. MS-DOS information, the vendor said.

PC Macbridge/AFP works with PC Macbridge/ATB, Tangent's Appletalk board for the IBM PC. The board enables the PC to function as a node on an Appletalk network, allowing it to communicate with other networked PCs, Apple Macintoshes and Adobe Systems, Inc. Postscript-based laser printers. Once software is installed, the PC becomes a client of an AFP server and can access both PC and Macintosh files. After logon, the PC user mounts a volume on the remote server and accesses its files as if they were internal to the PC.

Scheduled for availability in March, PC Macbridge/AFP costs $150. PC Macbridge/ATB, which includes PS Print, costs $350.

DEC

FROM PAGE 35

tems, Midland currently uses Vaxmates and Microvax IIs hooked together.

The Vaxmate's use of windowing conforms with Midland's decision to standardize around the interface, which was developed by Microsoft Corp., according to Banks.

But while Banks says he is pleased with the ability to interface between both DOS and DEC's VMS, he admits that Decnet has limitations.

"The main problem is that you can't run industry-standard software that relies on being able to find Netbios in order to run," he says.

"That excludes a lot of packages — particularly in the communications area — such as Microstuf, Inc.'s Crosstalk," he states.

See us at FOSE Booth S1368

The TOTAL solution for managing micros:

Introducing the most comprehensive, powerful and easy-to-use software available for managing, supporting and analyzing the use of microcomputers.

The Micro Resource Manager

Over 150 reports and inquiries give you fast and flexible access to essential information in these key areas:

- Inventory Management
- Warranties and Maintenance
- Purchasing and Receiving
- Training and Support
- Memos and Mailing Labels
- Management Analysis
- Problem Tracking and Resolution

Track hardware, software, peripherals on servers. Track PCs or mainframes, by item or by system. Analyze budgets and trends. Send memos to selected users. Log and assign user requests for support. The Micro Resource Manager (MRM) has the features and functions you need to save time, reduce costs, improve productivity and increase management control.

In addition, MRM's advanced user interface makes use of menus, windows, function keys, record scrolling and 'zoom' keys for rapid cross-searching of data and effortless navigation through the data base. Multiple report sequences and flexible selection criteria provide powerful ad hoc reporting. Rigorous data validation, automatic data base recovery, and multi-level user security ensure system integrity. Single-user (MS-DOS) and multi-user (LAN, XENIX, UNIX and ULTRIX) versions available.

Whether you manage 50 or 50,000 PC's, The Micro Resource Manager is the TOTAL solution you've been looking for.

Call or write today for our FREE demo diskette

200 W. Lowe Ave. · Fairfield, IA 52556 · (515) 472-6400

ATRIUM

Bridge supports redundant LANs

Observers say multimedia routing capabilities aimed at niche market

BY DONNA RAIMONDI
CW STAFF

MOUNTAIN VIEW, Calif.— Bridge Communications, Inc.'s Government Products Division has announced an internetwork bridge that supports redundant local-area networks (LAN) and a version of its Etherterm software that gives IBM Personal Computers the file-transfer capabilities of IBM 3270 PCs.

The Internetwork Bridge/1-Fault Tolerant (IB/1-FT), a product resulting from Bridge's January acquisition of Phoenix Technology, Inc., is said to provide multimedia routing between redundant LANs or between redundant and nonredundant LANs.

While such products are important to users who need 100% availability of their computers, such as banks and airlines, they are really niche-market items, said David Terrie, editor of Patricia Seybold's "Network Monitor" newsletter.

'Not the mainstream'

"You are talking about products that are pretty reliable as it is. The average server or gateway has a very low failure rate, so this is an extension of the fault-tolerant market, not the mainstream networking market," Terrie said.

The unit interfaces simultaneously to two Ethernet IEEE 802.3 LANs, two Bridge broadband LANs or a combination.

"If one cable plant is damaged, the IB/1-FT has an automatic recovery feature that directs all traffic over the unaffected cable," said Joseph Kennedy, vice-president of Bridge's Government Products Division.

The product costs $12,000 with three data links, plus $350 for a software license.

One possible configuration for the IB/1-FT is a redundant LAN backbone connecting multiple nonredundant Ethernet subnetworks, Bridge said.

The IB/1-FT can also extend broadband's 15-mile distance to multiple 15-mile segments.

Bridge also launched its Etherterm/3270 LAN software, which performs terminal emulation and file transfer between personal computers and the IBM mainframe environment through a LAN.

A single-user version that operates with a stand-alone PC costs $400; a network-server version shared by multiple PCs costs $2,000.

Etherterm/3270 lets IBM PCs access IBM mainframes as IBM 3278 or 3279 display stations and performs high-speed file transfers as IBM 3270 PCs. It also offers Digital Equipment Corp. VT100 terminal emulation and file transfer with ASCII hosts.

Something for everyone

"This is something that everybody needs, but it's not new," Terrie said.

Previous Bridge products allowed the user to go from an ASCII terminal to an IBM SNA host or from a 3270 to an ASCII host, he said.

The software requires that the PC be equipped with 3Com Corp. Etherlink or Etherlink Plus network-controller boards for direct attachment to an Ethernet LAN.

IBM, Motorola units linked via high-speed interface

AUSTIN, Texas — KMW Systems Corp. has introduced the Auscom 8400 VME Channel Interface, a high-speed, single-board interface between IBM mainframe channels and the VMEbus used by many Motorola, Inc. 68000-based engineering workstations.

KMW Systems says the Auscom 8400 features on-board intelligence to minimize VME processor support in communications functions.

In addition, the Auscom 8400 transfers data between the channel and the VME system memory at rates of up to 1M byte/sec., the vendor said. A standard feature is data-code conversion between the IBM host's extended binary coded decimal interchange code, also known as EBCDIC, and VMEbus systems' ASCII transmissions.

Communications

Communications between the Auscom 8400 and the VMEbus master take place through an on-board random-access memory communications region.

An on-board bit-slice microcontroller supervises communications as well as channel activity with the VME system CPU.

The Auscom 8400 is priced at $3,650.

X.25 bridges

FROM PAGE 35

dial-up lines for PCs and X.25 packet switching for minicomputer-based systems," Terrie said.

The G/Remote Bridge works in conjunction with Novell's external and internal bridges, which were designed to connect physically adjacent LANs. A starter kit for linking two LANs costs $2,990. It costs $1,595 to add each additional LAN.

The cost to add a single-user PC to the network is $795.

The bridge works with either dedicated or nondedicated micros. A packet assembler/disassembler interface incorporated into the bridge enables transmission over X.25 trunk lines or public or private data networks. As many as 32 remote LANs can be connected at the same time, according to the vendor.

Using the X.25 protocol, G/Remote Bridge runs at transmission speeds of up to 19.2K bit/sec.

"Typically, a PC has been limited to the 9.6K bit/sec. rate, so this gives you some added speed," Terrie said.

ISDN

FROM PAGE 35

taneous voice and 56K or 64K bit/sec. data transmission.

- The ISDN Attendant Console features more than 35 call handling and administrative features that can be updated at the carrier's central office.
- The ISDN 3270 Data Modules, enabling IBM 3270-type terminals to access hosts and cluster controllers through 5ESS-based dial-up services, eliminating the need to install coaxial cable.
- The ISDN 7500 Data Module, which interfaces synchronous and asynchronous data equipment with the ISDN network.
- ISDN key telephones and power equipment.

AT&T intends to sell the above products to the divested Bell operating companies, which will then distribute the terminals to their customers.

Other major customer premise and central office equipment manufacturers, such as NEC America, Inc. and Fujitsu America, Inc., are currently testing ISDN-compatible workstations at site trials.

While admitting that AT&T's early announcement of commercial availability gives it a head-start in closing contracts with the Bell operating companies, Fujitsu spokesman David Gould pointed out that Fujitsu expects to announce its own commercial offerings by year-end.

NEW PRODUCTS

Diagnostic equipment

International Data Sciences, Inc. has announced the **Blue Box II Model 672** RS-232C breakout box.

The Model 62 is said to provide users a pocket-sized monitor and breakout panel to isolate and solve modem/terminal problems at the Electronic Industries Association RS-232C and CCITT V.24 interface.

The Model 62 Blue Box II costs $199.

International Data Sciences, Seven Wellington Road, Lincoln, R.I. 02865.

Local-area network software

Corvus Systems, Inc. has enhanced its **Omninet** local-area network to provide full support of Apple Computer, Inc.'s Appletalk File Protocols (AFP) and Appleshare.

AFP support provides Omninet users with access to Appletalk-compatible, third-party software. Users will also be able to share Apple Laserwriter printers and Corvus Omnidrive network drives and directly interface with Appletalk.

Corvus also reduced the list price for its Omninet interface for the Apple Macintosh. The new price is $199. The Macintosh network interface is required to link the Mac to Omninet.

Corvus, 2029 O'Toole Ave., San Jose, Calif. 95131.

Links

Datanex, Inc. has enhanced its **Hasp+** communications software to allow Digital Equipment Corp. VAX and Microvax systems to link with IBM System/34, 36 and 38 computers.

According to the vendor, running Hasp+ in host or central mode allows the VAX to operate as a multileaving Hasp host. The IBM system must have IBM's Remote Job Entry facility.

Hasp+ communications software costs $5,500 for VAX and $3,500 for Microvax versions.

Datanex, P.O. Box 1728, Eugene, Ore. 97440.

Protocol converters

Advanced Computer Communications has introduced the **ACS 1030** communications interface said to allow IBM Systems Network Architecture systems to use X.25 packet-switched networks in a transparent manner.

The ACS 1030 offers service for eight fully independent Synchronous Data Link Control or asynchronous IBM connections. Connection to the host is made through existing line sets of an IBM 3705 Series front end. At the remote site, connection is made through the RS-232 port of devices such as an IBM 3274 controller supporting IBM 3278 terminals.

The ACS 1030 is priced at $15,500, the vendor said.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

File servers

Televideo Systems, Inc. has announced the **PM/286** local-area network (LAN) file server.

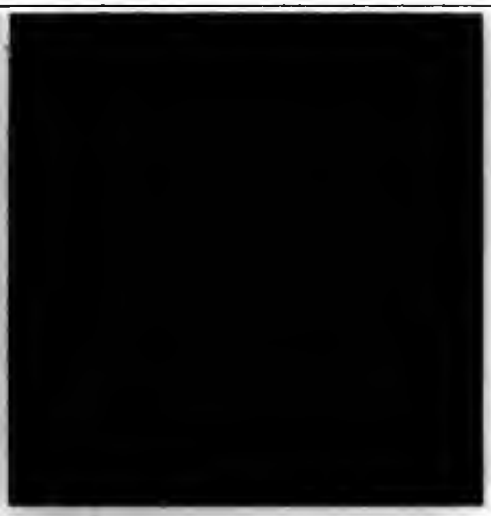
The file server is said to act as a bridge among disparate LANs. IBM Personal Computer or PC AT-compatible systems can connect to a PM/286 LAN through an interface card.

The product uses standard PC AT-compatible expansion slots and can accommodate off-the-shelf interface cards for Ethernet, AT&T's Starlan or the IBM Token-Ring network. The PM/286 is an active server on each connected LAN.

Each server features a built-in 45M-byte tape backup system; a 14-in., tilt-and-swivel monitor; RS-232C serial and parallel ports; and the Televideo Advanced Netware-286 operating system.

Prices range from $8,495 to $10,995.

Televideo, P.O. Box 3568, 1170 Morse Ave., Sunnyvale, Calif. 94088.



AGS knows...
building a better system
is not just a matter of
mending fences.

A successful information processing system must be constructed on a solid foundation. This foundation consists of a strategic design, state-of-the-art tools and technical aptitude; all of these comprise a system that is maintainable.

To achieve a quality system, many of the world's largest corporations and government agencies have called upon AGS consultants to design, implement and maintain their information processing systems.

Among our 1,800 professionals you'll find technical expertise in such areas as UNIX*, C, DB2, ADABAS, CICS, IMS, IDMS and SQL as well as extensive experience in networking, telecommunications, and computer manufacturing applications. In addition to their technical abilities, our consultants work well within existing management structures.

To find out how you can stop mending fences, send for our brochure, "In systems development...". Write AGS Information Services, Inc., 1139 Spruce Drive, Mountainside, New Jersey 07092.

33 offices throughout the United States and Europe.
Also serving the Federal Government marketplace.

*UNIX is a trademark of AT&T Bell Laboratories.

AGS



Big.

The first version of INGRES was a big idea. A high-performance easy-to-use relational database system for minicomputers.

Bigger.

Next came an even bigger idea. Apply the same technology, performance and user-friendly environment to the mainframe. Giving more users access to powerful data management tools and more programmers access to an advanced program development environment.

Biggest.

Now Relational Technology is proud to introduce our biggest idea yet. The same INGRES system, the same database once available only to mini and mainframe users, is now available on the smallest computer of all: the PC. With the introduction of INGRES for PCs every management information user in your company can speak the same language.

Learn more about INGRES for PCs at a FREE INGRES Seminar. Call 800-4-INGRES today! For Canadian seminars call 415-748-3444.

We know you will agree: INGRES for PCs is our biggest idea yet.

INGRES

Relational Technology
1080 Marina Village Parkway
Alameda, CA 94501-9891

HARD TALK



Rosemary Hamilton

Vendors snipe; users suffer

Distributed computing is becoming a hot topic — and rightly so, because it holds many potential benefits for users, particularly engineers. Among other things, it would provide a new way to optimize computing resources on a network.

Because of its importance and its highly technical nature, the concept of distributed computing should be presented to users in a clear-cut way to assist them in their decision making. Instead, it has become the latest debate between longtime engineering workstation rivals Apollo Computer, Inc. and Sun Microsystems, Inc.

Apollo started things off in early February by announcing its Network Computing System (NCS), a full suite of tools that would allow users to simultaneously run portions of one application on various systems on a heterogeneous network. Not to be outdone, Sun countered the following week by claiming that it has had distributed computing tools on the market for

Continued on page 43

Software vendor lauds RT PC

BY NINAMARY BUBA MAGINNIS
CW STAFF

IRVINE, Calif. — The latest IBM RT Personal Computer hardware enhancements have given IBM a competitive advantage in the workstation market, according to an engineering software vendor whose firm served as a beta-test site for the original RT PC announced one year ago.

Jon Prun, a technical director for Manufacturing Consulting Services, Inc. (MCS), a software house in Irvine, Calif., says he is anxious to take advantage of the RT PC's increased power. "The delivery date IBM quoted was April. We are trying to get them to expedite that," Prun says.

An MCS benchmark comparing the earliest RT to a similar Apollo Computer, Inc. workstation showed the RT performed 40% to 60% slower in runtime than Apollo, Prun reports.

"Most of our customers — or potential customers — discovered that independently," Prun says, explaining that his clients steered clear of the RT because of its cost/performance ratio.

IBM's first round of enhancements, announced in mid-1986, allowed MCS to upgrade its RT PC. "It wasn't until this week that they were actually, truly competitive in the marketplace," Prun says. IBM introduced RT PC models Feb. 17.

MCS markets two software applications, Anvil-5000, a computer-aided design and manufacturing (CAD/CAM) package; and Anvil-1000MD, a two-dimensional CAD package. The engineering software firm has ported its applications to hardware offered by several companies, including Apollo, Sun Microsystems, Inc., Digital Equipment Corp., Hewlett-Packard Co., Prime Computer, Inc. and Data General Corp.

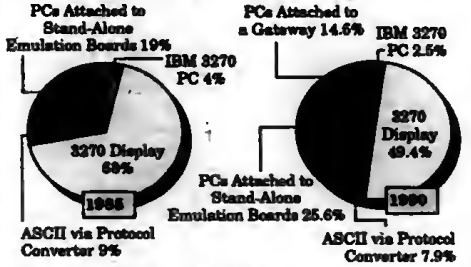
IBM representatives told Prun that software written for the older RT will run without modification on the new models. Until MCS receives the enhanced workstation, the portability remains to be seen, Prun says.

When MCS first ported Anvil-5000 to the RT, it was the easi-

Continued on page 42

Data View

Personal computers
Eating into IBM 3270 market



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART: MITCHELL J. HAYES

Low-cost IBM terminals out

BY STANLEY GIBSON
CW STAFF

NEW YORK — IBM recently unveiled lower cost terminals and controllers for its mid-range and large systems.

Three 3192 terminals were introduced for use with IBM 370 hosts. IBM also added two 3197 terminals for use with System/36 and 38 computers and two 3174 controllers designed for IBM 370, Series/1 or System/88 machines.

All five terminals are

Continued on page 43

Masscomp speeds up MC5000s

BY JAMES CONNOLLY
CW STAFF

WESTFORD, Mass. — Masscomp last week boosted the performance of its MC5000 family of scientific systems by implementing faster microprocessor technology on its lower end products and adding support for two extra CPUs on the top-end system.

In addition, the company introduced a set of optimizations for its Fortran compiler, a graphics-compatibility library to help customers and third-party software developers support Masscomp graphics and to implement Sun Microsystems, Inc.'s Network File System.

The key to the performance gain is the use of faster Motorola, Inc. 68020 microprocessors. The enhanced systems are the MC5350, MC5450 and MC5550. Masscomp officials said earlier models, the

Continued on page 43

Inside

- Memorex introduces compact display terminal for use with IBM systems. Page 42.
- Mass-memory subsystem for VME-based systems out. Page 46.
- Calcomp announces digitizer for military, government applications. Page 46.

SYSTEM 2000® DBMS for Only $12,000

All the Extras Without the Extra Costs

You don't have to spend a bundle to get a full-function data base management system. For a first-year fee of $12,000, SYSTEM 2000® DBMS gives you:

- an integrated data dictionary
- on-line query/update
- a report generator
- relational data base access
- programming language interfaces
- high-quality training and technical support.

Renewal rates are even lower. Plus, you can now link SYSTEM 2000 DBMS with the SAS® System of software to build data bases, store and retrieve data, merge and manipulate data, perform your analyses, and produce reports and presentation graphics. You can even give Information Center users access to your DBMS through easy-to-use SAS menus.

Before you invest a bundle, find out why SYSTEM 2000 DBMS is the most economical data base management system in the industry.

SAS and SYSTEM 2000 are registered trademarks of SAS Institute Inc., Cary, NC, USA.
Copyright © 1986 by SAS Institute Inc. Printed in the USA.

SAS Institute Inc.
Box 8000, SAS Circle
Cary, NC 27511-8000
(919) 467-8000 Telex 802505

IBM minis get display terminals

MILPITAS, Calif. — Memorex Corp. has introduced a compact display terminal for use with the IBM System/34, 36 and 38 and a line printer designed for use with IBM mainframes.

The Memorex 2296 monochrome terminal is intended as an alternative to the IBM 3196 Model 10, particularly in data-entry applications, according to the company.

The 2296 occupies less than two square feet of desk space and includes features that are not available on the IBM 3196, including a screen-printer port, a quick-command-key set-up menu and optional antiglare filters, according to Memorex officials.

The 2296 is available now and costs $1,210.

The Memorex 2062 line printer family is offered as an alternative to IBM's 3262 printer. The printers were designed for heavy transaction loads and print at 400 or 800 line/min.

Memorex officials said the printers are intended to handle draft, data processing, letter-quality, bar code and line-and-block graphics printing.

According to the company, the printers are suited to office or industrial environments and come in standard cabinets that allow 60-DBA operation. An optional 55-DBA sound-deadening package is available.

The 400 line/min 2062 Model 1 is priced at $10,000. The 800 line/min Model 2 is priced at $13,700.

RT PC

FROM PAGE 41

est port the engineering software house had ever performed, Prun notes. "It was a very pleasant surprise. The performance of the original was about half of what you would find on a Sun or Apollo. With the new hardware, we feel it's going to be at least as fast as the top-of-the-line Suns and Apollos," he says.

When porting its applications to other vendors' hardware, MCS experienced limitations, Prun reports. Anvil-5000 is written mostly in Fortran with about 1% written in C or assembly language. The application consists of 4,000 subroutines and one million lines of code.

"IBM is the first vendor we have not had problems with," Prun says. When porting Anvil to the Hewlett-Packard 9000 Series 500, the hardware gravely limited the number of subroutines that could be linked in one pass. To solve the problem, Prun was required to run a two-pass link process. "It takes more time to do and takes about twice the disk storage as the one-pass process. And it also makes the building of executable code more complicated," Prun notes.

With Prime, Prun says, there was a limit to the number of symbols one could have on an executable process. "Again, we didn't have that limit on the RT," he adds. In the past, some hardware, such as Apollo's early workstations, had a 16M-byte or less limit to runtime executable code. "The RT did not have any limit," Prun says.

> "I'm not much more positive than I was a year ago. [The RT PC] is still overpriced, but you can get something for your money."
>
> RICHARD SHAFFER
> TECHNOLOGIC PARTNERS

Yet industry analysts remain skeptical. "I'm not much more positive than I was a year ago. Now the machine is worth using. It's still overpriced, but you can get something for your money. If you're IBM, all you have to be is adequate," observes Richard Shaffer, principal of Technologic Partners, a New York-based financial consulting company.

John McCarthy, research manager at Cambridge, Mass.-based Forrester Research, Inc., says, "IBM is getting very serious about this market. That's the good news. The bad news is it's IBM's third architecture at the mid-range."

The enhanced RT is more competitive than DEC's new Vaxstation 2000, according to Charles Foundyller, president of Daratech, Inc., a Cambridge, Mass.-based research firm. "The RT is not a blocking move," says Foundyller, explaining that DEC's low-cost 2000 series workstation will serve only to keep DEC shops from buying the less expensive Apollo and Sun products.

"The RT is a move to win a new set of users for IBM and its RT architecture," Foundyller adds. "Basically, it's a strong machine and bears the promise that others are on the way. And if you buy that promise, I think you have to move to the RT."

Streamline your DP operations



with a Tandy® 3000 HD XENIX® system.

Break away from your mainframe with the powerful Tandy 3000 HD. The 3000 HD supports the versatile XENIX System V (based on UNIX® System V, the standard of the UNIX world). Extras include a "C-shell" programming environment, a menu-driven help system and support for Tandy peripherals. The high-performance Tandy 3000 HD helps make systems development more efficient and cost effective.

The Tandy 3000 HD is compatible with the IBM PC/AT®, yet offers greater hard disk storage (40 MB vs. the PC/AT'S 30). Better yet, the 3000 HD is priced at only $4299 (vs. $5295 for the PC/AT*).

Based on the 16-bit Intel 80286 microprocessor, the Tandy 3000 HD (25-4011) operates at 8 megahertz. And since the 3000 HD is a multi-user system, people located throughout your office can all simultaneously access it from inexpensive data terminals, for program development, as well as user applications.

Come into a Radio Shack Computer Center for a demonstration today. The Tandy 3000 HD is your key to total office automation.



TANDY COMPUTERS: In Business . . . for Business™

Radio Shack
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

*Based on IBM price list as of April 2, 1986. Tandy 3000 HD price applies at Radio Shack Computer Centers and participating stores and dealers. Monitor, data terminals and XENIX sold separately. XENIX/Reg. TM Microsoft Corp. UNIX/TM AT&T. IBM PC/AT/Reg. TM International Business Machines Corp.

Vendors

CONTINUED FROM PAGE 41

months. This statement came as a surprise to many users and analysts, but Sun responded by saying it has marketed these tools in a low-key manner.

"This is a my-dog-is-bigger-than-your-dog situation," says Richard Shaffer, principal of Technologic Partners in New York. "But it doesn't matter whose dog is bigger. What matters is how many people are going to support what dog."

But just who is making use of these capabilities is not very clear, either. Late last month, Apollo retreated from its claim (made during the announcement) that NCS was at beta-test sites and said testing was being conducted strictly in-house.

Transparent access

Meanwhile, Sun says its tools are being implemented by many of its Network File System (NFS) licensees. NFS allows for transparent access of files across a heterogeneous network and has been licensed by nearly 100 vendors and universities. But there are apparently only a few in this group of 100 that are actually using these tools to distribute applications across a network for computation.

Furthermore, customers using the Sun tools do not appear to be fully exploiting the concept of distributed computing. At Computervision Corp., which resells Sun workstations as part of its Caddstation product, software developers have written computer-aided design software for a distributed computing environment. At this point, the software reportedly can only work in a Cadds environment — not in a multivendor installation, which is a key issue at engineering sites.

Currently, portions of the Cadds software can be split between the Caddserver and various Caddstations on a network, according to Chris Gregory, a Computervision systems marketing manager.

Just how similar the Apollo and Sun products are is also unclear. A closer inspection of the two offerings shows that Apollo has advantages in certain areas. For instance, it offers a key component, called the Location Broker, that would be responsible for tracking available resources on a network and assigning tasks to the most appropriate system that is available at the time of execution.

Sun does not have this capability, but then Apollo really doesn't either. Sun may have a less comprehensive package, but it does have some tools on the market. Apollo's won't be available until iste in the year.

Sun has been releasing tools since May 1985, the latest of which was unveiled in August along with the newest release of Sun's operating system. This tool, which includes both a compiler and a high-level language — critical components in the distributed computing environment — was not mentioned in the official announcement.

"It's our fault," says Chris Wellens, a Sun network services product manager. "It was part of that release, but no one understood how important it was. It slipped through the cracks."

But Phil Neray, a marketing manager at Alliant Computer, Inc., a minisupercomputer maker that supports both Sun's NFS and Apollo's NCS, says, "As far as I know, Sun hasn't announced all these tools." According to Neray, "If Sun came out with the same capability as Apollo, chances are we'd want to support it as well. Many of our customers have Sun workstations."

Hamilton is a *Computerworld* senior writer.

Masscomp

CONTINUED FROM PAGE 41

MC5300, MC5400 and MC5500, can be upgraded for performance gains of 20% to 30%.

The MC5350 features a 16.7-MHz 68020 in place of the 12.5-MHz version in the MC5300. The MC5450 and MC5550 use 20-MHz chips rather than the 16.7-MHz CPU used in the MC5400 and MC5500.

Masscomp also claimed 50% performance gains for the high-end MC5700 with the addition of two CPUs to the previous maximum of four processors.

A basic MC5350 configuration, including 45M bytes of disk storage, an alphanumeric terminal, four communication lines and 2M bytes of memory, has a list price of $15,250, which is also the MC5300's price.

A basic configuration of the MC5450 costs $22,750, which is $1,000 more than the MC5400. A basic MC5550 costs $29,750. The systems are scheduled for availability in April of this year.

Analysts observed that Masscomp has been stronger in recent quarters than for several years.

'Out of mainstream'

"One of the things they have done is to try to stay out of all the activity in the mainstream of the engineering workstation market. They really have been focusing on the real-time and scientific markets," said Hal Feeney, a technical systems analyst for Dataquest, Inc., a San Jose, Calif.-based market research firm.

Feeney observed that Masscomp has avoided direct competition with workstation vendors such as Sun and Apollo Computer, Inc. Omri Serlin, owner of Los Altos, Calif.-based consulting firm Itom International, said Masscomp has been struggling, although it has recently shown some business gains. He observed that the real-time scientific arena does not provide enough sales volume for long-term growth and that Masscomp still needs major OEM contracts to continue growing.

DEC Q-bus supermicro released

BY ALAN J. RYAN
CW STAFF

HARTFORD, Wis. — General Robotics Corp. has announced a supermicrocomputer that is based on the National Semiconductor Corp. 12.5-MHz 32032 microprocessor and is said to be 50% faster than its predecessor.

The Python/32T, a 1.5 million instructions per second (MIPS) supermicro for the Digital Equipment Corp. Q-bus, performs compute-bound tasks more quickly than the 10-MHz Python/32B. General Robotics said National Semiconductor's optimizing C compiler improves machine-code generation.

The Python/32T CPU with 4M bytes of memory and an AT&T Unix System V.3 license costs $7,500 in OEM quantities.

Low-cost

CONTINUED FROM PAGE 41

equipped with printer ports so that an inexpensive printer may be attached to the terminal rather than requiring a user to share a more expensive printer on a network. An added feature of the terminals is a 1,500-char. keystroke buffer.

"The prices are less than for previous models. For the first time, they are in a price-leadership role. They put pressure on independent suppliers," said Ilene Goldman, an industry analyst with International Data Corp., a Framingham, Mass., research firm.

The terminals come with a one- or three-year warranty. Previously, IBM offered only a nine-month warranty, Goldman pointed out.

Direct-attachment feature

The terminals replace models introduced three years ago, she said. The printer direct-attachment feature is offered by a number of independent terminal suppliers, according to Goldman.

The 3192 models, which come in monochrome and color versions, are priced from $1,795 to $2,795. The 3197 models, available in monochrome and color versions, are priced at $1,795 and $1,895.

The two controllers are designed for users requiring attachment to a host of only one to eight printers or display stations. Previous models had offered 16 attachments.

The controllers are also different in that, unlike previous 3174 models, they allow connections to both the Series/1 and System/88 hosts.

Goldman said the 3174 Model 81R and 3174 Model 82R cluster controllers are the first IBM has offered that do not support all kinds of IBM terminals. She said, for example, they do not support an ASCII adapter card.

PC connection

"It doesn't make sense to me, because small shops have PCs they want to connect to a controller. You still need an Irma-board to connect a PC," Goldman said, noting that many users tie personal computers to hosts using products such as the Digital Communications Associates, Inc. Irma product.

Goldman said IBM explained the controllers' limited features as necessary to keep their prices down. She added that she expects another version of the 80-series controllers that supports IBM's Token-Ring network, which the 81R and 82R do not support.

The controllers are the same except for supporting different sets of protocols. Each is priced at $3,500 and will be available in the second quarter.

CICS Presentation Announced:

Bob Yelavich - IBM Dallas Systems Center; conducts a full day session for Metro NY CICS Users Group.

Bob Yelavich will present a CICS Product Update with emphasis on the current status of CICS/VS 1.7 and 2.1. Included will be CICS related product announcements, CICS trends and directions, an assessment of current product, and requirements for possible future implementations. Bob works closely with the Hursley England development group; is the CICS representative to SHARE and GUIDE, and has authored many CICS technical bulletins and articles.

Sponsored by TelTech:

Thursday, March 12
Pace University - downtown Manhattan
For further information call: 1 (800) 331-1819
in New York call: (212) 514-5440

NEED TO WRITE A

DISASTER RECOVERY PLAN??

DON'T REINVENT THE WHEEL . . .
CALL FOR YOUR **FREE**

PRACTICAL GUIDE TO DISASTER RECOVERY PLANNING

AND ASK ABOUT OUR PLANNING "KIT"

Business Recovery Systems, Inc.

1-(800) 654-2493 *(303) 298-5320*

MSA

The Software Company

Introduces:

MSA

Advanced Manufacturing

The World's Largest Supplier Of Applications Software Designed Especially For Manufacturers.

Until now there was no single reliable source manufacturers could turn to for all their manufacturing software needs. Now there is. Management Science America, Inc. has put it all together in MSA Advanced Manufacturing, the world's largest and best supplier of applications software for manufacturers.

MSA has the best systems and more of them. Packages that help you with resources planning, shop floor and assembly planning, human resources, accounting, distribution, sales and marketing.

What's more, these systems are synergistic. They talk to one another through our exclusive Information Expert™ technology. They even talk to in-house software you may already have. So you don't have to scrap what you have and start over.

We get you up to speed and online fast, too. That's because MSA software is written by the most experienced manufacturing software specialists in the business. People who have worked with almost every conceivable industry.

And, MSA experts stay with you after implementation. We don't sell you and leave you. Our R&D protects you, too. MSA invests more in R&D than any other software company. So we can keep your technology continuously updated.

In this increasingly competitive world, you can't afford not to talk to MSA Advanced Manufacturing about your software needs. We have the broadest range of quality systems. We provide the best service and support, the most expert on-staff help, more R&D, and superior technology. Make us prove it. Call Robert Carpenter, MSA Advanced Manufacturing, at 404-239-2000.

MSA The Software Company

©1987 Management Science America, Inc.

NEW PRODUCTS

Processors

Datacube, Inc. has introduced **VFIR-MKII**, a video finite-impulse response (VFIR) filter for its Maxvideo VMEbus-compatible, real-time image and digital-signal processing family.

VFIR-MKII is a single-board video finite-impulse response module said to implement a programmable 64-point finite-impulse response filter with on-board multiplier/Asynchronous Line Unit (ALU) hardware to speed processing. It is said to provide more than six times the number of programmed filter coefficients and integrate the ALU and software-controllable delay lines, previously features on Datacube's Max-SP module.

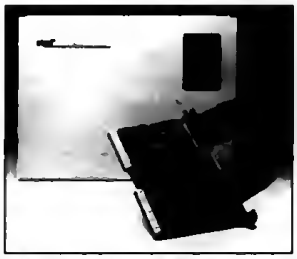
Each VFIR-MKII module costs $7,800.

Datacube, 4 Dearborn Road, Peabody, Mass. 01960.

Zitel Corp. has announced a 128M-byte mass-memory subsystem for VME-based systems, called the **VME93**.

The subsystem is said to execute single-bit, error-corrected block transfers at a rate of up to 40M byte/sec. It performs normal READ, WRITE, READ-MODIFY-WRITE and unaligned transfers of D8, D16, D32, A24 and A32 modes.

The VME93 occupies one bus slot and is available in 32M-, 64M-, 96M- or 128M-byte configurations. It consists of a VME interface set and Zitel's standard System 93 memory system, which includes chassis and error logger.



Zitel's ***mass-memory subsystem***

The VME93 is priced at $1,300 per megabyte.

Zitel, 630 Alder Drive, Milpitas, Calif. 95035.

Novix, Inc. has announced the **NB4300**, a bus card built with the company's 16-bit, 8- to 10-million instructions per second NC4016 microprocessor.

The card is said to be capable of master and slave bus control. It supports 20-bit addressing, has an 8-bit data bus and performs word fetches or stores from the microprocessor in two bus cycles.

On-board memory can include up to 32K bytes of programmable read-only memory and 128K bytes of high-speed random-access memory.

There is one RS-232 port and a B-port connection to a 26-pin connector on the front of the card.

The standard NB4300 is priced at $1,170.

Novix, Suite 280, 19925 Stevens Creek Blvd., Cupertino, Calif. 95014.

CAD/CAM/CAE

Calcomp has introduced the **Model 25128** digitizer, designed to meet Nacsim 5100A requirements for military and government applications.

The digitizer has an active digitizing area of 12 by 12 in. It has a flush surface and recessed connectors, and the power supply is contained within the tablet case.

The interface is said to be compatible with RS-232C, RS-422 and MIL-SD-188-114.

Seven modes of operation are selectable via CPU command or soft keys: point, prompt, delta, increment, halt, line, track and run.

Standard output rate is 125 coordinate pairs per sec., and data transmission rates are selectable from 300 bit/sec. to 19.2K bit/sec.

The Calcomp 25128 digitizer is priced at $1,995.

Calcomp, P.O. Box 3250, Anaheim, Calif. 92803.

Printers/Plotters

Honeywell Information Systems Italia has announced four **serial matrix printer mechanisms**.

The mechanisms are said to feature line widths from 8 to 15.6 in. and carriage speeds up to 40 in./sec. They are suited for printers up to 156 col. and 480 char./sec.

The mechanisms can reportedly be optionally equipped with nine- and 18-wire ballistic print heads.

All mechanisms are available as stand-alone products with cover sets, electronic boards or power supplies.

According to the vendor, the Model 4/66 is a color multifunction mechanism. The Model 36 is a 13.2-in., high-throughput mechanism.

The Model 12 is an 8-in.-wide mechanism, and the Model 32 is a 13.2-in.-wide version of the Model 12.

Prices range from $250 to $700 in quantities.

Honeywell Information Systems Italia, Suite 800, 120 Howard St., San Francisco, Calif. 94105.



PC Business World. The definitive source of information on the IBM PC and compatible market in the United Kingdom.

The only U.K. weekly conceived, written and distributed exclusively for the IBM corporate purchaser. With the highest circulation in the U.K. market to key decision makers at IBM PC and compatible user and dealer sites.

But if you prefer to base your ad buying decisions on numbers, not statements, consider this:

- CEOs, Financial Managers, Consultants and DP Managers comprise nearly 20,000 of the over 33,000 controlled circulation of *PC Business World.*
- In 1985, nearly 800,000 IBM compatible PCs, worth $2.7 billion (U.S.), were sold in the U.K.
- During the next 12 months, *PC Business World* subscribers intend to purchase over 744,000 PCs.*

These numbers, along with the following reasons, add up to make *PC Business World* the smartest ad buy for reaching PC users and buyers in the U.K.

PC Business World is a publication of CW Communications/Inc., the world's leading publisher of computer-related newspapers and magazines, with over 55 publications in 28 countries. And over 10 years of experience in the international computer marketplace.

When you advertise in *PC Business World,* you deal *direct* with the publisher through CW International Marketing Services, *not* with a rep firm. Yet, you are still entitled to the full 15% agency commission, with *no* Value Added Tax to offset those commissions.

It also means that you control your ad budget right here in the U.S., are billed in U.S. dollars, and have no time or language barriers to contend with.

PC Business World. Authoritative. Insightful. Focused. Effective. And both first and second-place winner of the 1986 *Hewlett-Packard/Times* Computer Journalist of the Year award. Truly in a league by itself.

For immediate response, call Frank Cutitta, Managing Director, CW International Marketing Services, toll-free at 800-343-6474 (in MA 617-879-0700).

PC BUSINESS WORLD

A CWCI Publication
An International
Data Group Company

*PC Business World Readership Survey, July 1986



MANTIS® vs. CSP

Before You Pass Judgement, Bring Both To Trial.

Considering CSP? Then consider this: with MANTIS from Cincom® you can prototype, develop and process better quality applications, faster, and more effectively than CSP from IBM®. And the higher quality MANTIS applications are far easier to maintain.

Fewer Development Steps Mean Faster, Easier Program Development.

MANTIS is more powerful than CSP, and it is much easier to learn and use. MANTIS gives faster start-to-finish development of applications. Its functionality also enables a much broader and more comprehensive range of usage. For example, studies show that 90% of all MANTIS users are using MANTIS for over 90% of all on-line development.

More Flexibility, Complete Portability.

MANTIS supports all the same environments as CSP, and provides complete portability to DEC™ VAX™ and MicroVAX™, WANG® VS, NCR® VRX, and certain Honeywell® systems.

Fast Processing Means Low Cost.

Its high speed processing facilities make MANTIS usable for almost all on-line requirements, thereby increasing programmer productivity while also cutting processing costs.

Why Not Learn More?
Call Today For An In-House Trial.

Don't make a final judgement until you have all the facts about MANTIS. Call today to set up an in-house trial. Experience the ease, speed and power that MANTIS provides in solving **your** application development needs. You'll be glad you did.

1-800-543-3010

In Ohio, 513-661-6000.
In Canada, 1-800-387-5914.

CINCOM®

World Headquarters
2300 Montana Avenue, Cincinnati, Ohio 45211

MANTIS is a registered trademark of Cincom Systems, Inc. IBM is a registered trademark of International Business Machines Corporation. DEC, VAX and MicroVAX are trademarks of Digital Equipment Corporation. NCR is a registered trademark of NCR Corporation. WANG is a registered trademark of WANG Laboratories, Inc. Honeywell is a registered trademark of Honeywell, Inc.



How many possibilities are there

For customized solutions to networking problems, AT&T comes through.

The AT&T STARLAN Network is so flexible, you can tailor it to suit your specific needs, to get your people sharing information, software and high-priced peripherals.

If you've got just two PCs and one printer, or more PCs and peripherals than you care to count, you can easily link all of them together with the STARLAN Network using standard telephone wiring.

AT&T's STARLAN Network is so compatible it works with PCs and software made by different manufacturers. Even MS*-DOS and AT&T's UNIX® System V workstations are able to share information and resources, giving users easy access to one another's files.

As many as ten computers can be linked together in a basic Daisy Chain configuration. And there's no expensive central equipment to buy, so your start-up costs are kept to a minimum.

When you're ready to expand, the STARLAN Network's modular design makes it simple. With Network Extension Units, you can add on over one hundred users spread across an entire department or small business. Even your departmental

*Trademark of Microsoft Corporation



with AT&T's STARLAN Network?

STARLAN Networks can be linked by connecting them to AT&T's powerful Information Systems Network, giving you a fully integrated system with PCs, mainframes and terminals.

The STARLAN Network also offers AT&T service and support, including installation, documentation, maintenance, training and hotline assistance.

From equipment to networking, from computers to communications, AT&T comes through. To find out how to take your first step toward a flexible networking solution, contact your AT&T Account Executive, your authorized AT&T supplier, or call 1 800 247-1212.

AT&T
The right choice.

Hang Up The Phone, Cancel Your Meetings, Forget Your Memos. Start Communicating.

You could spend your whole day just attempting to communicate. Playing telephone tag. Running back and forth to meetings. Toiling through mountains of memos. Just like millions of frustrated executives do every day. Or you could stop attempting and start communicating.

Introducing The Coordinator System.®

The Coordinator System is workgroup productivity software that streamlines communications between you and the other members of your group or department. It provides tools for thinking and planning to effortlessly bring together your team's goals, actions and followup activities.

Developed by Action Technologies, Inc., and adapted for NetWare® LAN systems, The Coordinator System gives you immediate access to records of your conversations, project reports, and a daily calendar. It tracks any requests or commitments you make, and as your plans evolve it automatically informs others of changes that affect them. This minimizes forgotten commitments, miscommunication and wasted time.

Through LANs, bridges and phone lines, The Coordinator System can connect users worldwide, reducing reliance on overnight mail, couriers, telemail and telex. Yet the average cost of a communication is just five cents, including equipment and carrier costs.

A New Class of Software.

The Coordinator System delivers on PCs today what costly mainframe office automation systems promise—productivity. And at a fraction of the cost. Companies already benefitting from this new class of PC software include GTEL, TRW, Du Pont, and, not surprisingly, Novell.



Running with NetWare, the Coordinator System capitalizes on the connectivity of LANs to streamline communication as never before. For a demonstration or more information, visit your Authorized NetWare Dealer, or call 1-800-LANKIND.

NOVELL.
Milestones Ahead.

©1987 Novell, Inc., World Headquarters, 122 East 1700 South, Provo, Utah 84601 (801) 379-5900

Three team leaders master a framework for managing change

Managers learn to think in terms of change sponsors, change agents and change targets

BY MICHAEL SULLIVAN-TRAINOR

There is nothing pretty about technological change. Replacing old systems with new ones holds the promise of increased efficiency, but it also causes the users a significant amount of pain. Thrust into this scenario, the MIS manager does his best to implement new systems without getting mauled by users in the process.

Many managers excel at change management. However, even the best of these operate more on instincts developed from dealing with hostile users than according to any written guidelines. The intuitive approach works well so long as there are plenty of in-house change management gurus to go around. But what if the project is too large for one person to handle or there is no experienced manager available?

Many corporations turn to independent consultants to solve the problem. But while this approach may meet present needs, it fails to arm the company with a permanent way of coping with change. When the consultant leaves, the change management expertise goes with him. An alternative approach involves adopting a set of structured change management principles that can be applied to the present project as well as to future ones. To acquire these principles, many companies send their project managers to programs that offer training in this area.

Representatives from 20 organizations, including McDonnell Aircraft Corp., 3M Corp. and Merck, Inc., recently attended an intensive three-day program on the human aspects of technological change sponsored by O. D. Resources, Inc., an Atlanta management consulting firm. The goal of the program is to provide each project manager with a framework for managing technological change. Consisting of the O. D. Resources' principles of change management, the framework can be applied to present and future projects. Ultimately, the concepts can be passed on to other managers within the company who are implementing other change projects.

'Tools for the swamp'

No one seminar can address all the complexities of organizational change, but the O. D. Resources approach does provide the principles for effective implementation, according to Jack Tesmer, manager of 3M's change management department. Tesmer says the seminar does not provide an analysis of an organization's value system or suggest what that value system means for the future of the company, as some management consultants do. But it does enable the project managers to carry out the change without calling upon outside assistance.

"They give you the tools to walk through the swamp," Tesmer says. "I'm not sure they give you the tools to tell you about the nature of the swamp."

Nevertheless, 3M is considering offering elements of the O. D. Resources' approach to change management in its worldwide executive and management development programs, according to Tesmer. 3M's interest in the seminar stems from the positive reaction of information systems department members after their participation in the program.

McDonnell Douglas Corp. is also considering implementing some of O. D. Resources' change management principles on a wider scale after it received positive feedback from one of the corporation's project managers who attended the workshop. Ken Link, a project manager for McDonnell Aircraft, part of McDonnell Douglas, attended the seminar to find a structured way of addressing resistance to change and the uncertainty of a large population of users. Link is responsible for taking a hodgepodge of automated logistics systems maintained by separate departments at McDonnell Aircraft's St. Louis location and combining them into one computer-aided logistics system. He has 30 staff members to help him dramatically change the work lives of 2,600 people.

Having earned his management credentials by working his way up through user departments, Link has an intuitive understanding of the issues users face. But because of the size of the project, he is unsure how to address the reaction of the users as a whole. "The people in the trenches are enthusiastic about the change. But there is a group of middle- to first-line supervisors who are very quiet. Part of



Sullivan-Trainor is a senior writer for *Computerworld*.

• The pain new systems inevitably bring

• Managers are stuck as monkey in the middle

• How to win support at many levels

the problem is uncertainty, but I need to bring out a strong level of commitment," Link says.

As a first step to addressing problems like Link's, the O. D. Resources seminar leaders instruct participants to view their change projects objectively so that the extent of the projects' impact on the users and the company can be identified. The participating project managers are asked to compare what is happening in their environments with the following factors that users commonly face when asked to accept new technology:

- New skills are required.
- Communications patterns are altered.
- Time spans between communications are decreased.
- Points of influence, authority and control are redefined.
- Roles, work relationships and reporting responsibilities are modified.
- Data ownerships shift.
- Privacy and security concerns increase.
- New management techniques and organizational structures evolve.

Confronted by the potential trauma of these changes, many users are reluctant to give up the security of their current systems for the unknown challenges posed by the new technology. To battle this reflex resistance to change, seminar participants are encouraged to think of their actions in terms of planting wedges in the user environment to make the present state so uncomfortable that the change will look more positive.

TO BATTLE the reflex of resistance to change, seminar participants are encouraged to think of their actions in terms of planting wedges in the user environment to make the present state so uncomfortable that eventually the change will look more positive.

Strategically, this involves three steps:

- The wedge: Initiate actions that dispute the viability of the present state and promote movement away from current expectations.
- Transition: Initiate actions that provide structure, guidance, confidence and trust while encouraging movement.
- The magnet: Initiate actions that confirm the viability of the desired state and promote acceptance of the new expectation patterns.

Although it is early in their project, the team members from 3M that attended the seminar are initiating many of the tactics outlined in this strategy.

3M harvests change

The 3M project involves converting all the company's applications running on Digital Equipment Corp. Decsystem-20s to other environments, such as DEC VAX systems, with the goal of shutting down the 20s at some point in the future. DEC has said it will stop providing service for the 20s in 1993. About 10,000 users will be affected by the project, which involves 18 Model 2060s and 19 2050s.

Besides user resistance caused by an upgrade in technology, the three-person team is also fighting financial objections. Converting to new equipment means a large expenditure by user departments, which conflicts with management's mandate to keep expenses down.

To address resistance, the team introduced a wedge by informing users it intended to shut down the Decsystem-20s before DEC dropped support. It also provided a magnet to address financial issues and other objections in the form of a chargeback plan that makes it less expensive for users to run their applications in the VAX environment than in the Decsystem-20 environment. So after the initial expenditure in equipment, the users could realize savings because their systems would be operating more efficiently.

Now, most of the users' new applications are being designed to run in the VAX environment, according to Hugh McDonald, lead analyst for the team. This tactic goes a long way toward accomplishing the changeover in technology, and it allows users to gradually become familiar with the workings of the new systems.

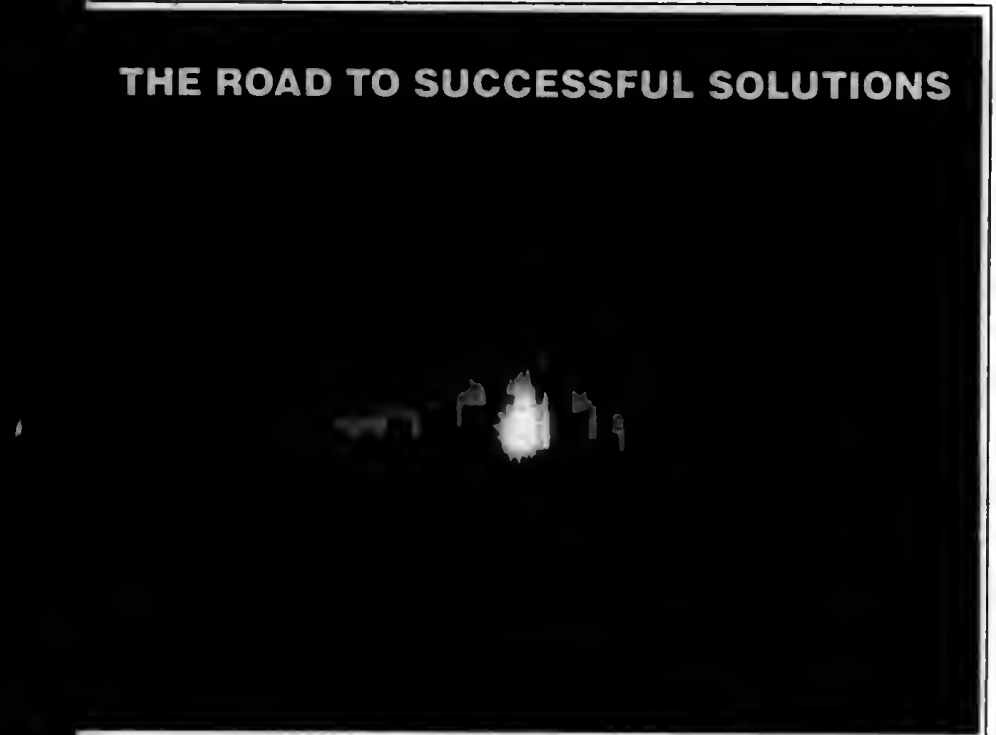
The current Decsystem-20 applications are a different story. Because of a combination of factors, many users are skeptical about how quickly the Decsystem-20s will be shut down, and they deny that the change will affect them. "The users have taken a wait-and-see attitude on the old applications that need to be converted to the new system. They're not convinced that we're going to pull those machines out in a time frame they have to be concerned about," McDonald says.

Sharon Young, the team's unit leader, adds, "We have quite a bit of time here, and a lot of these applications have a lifetime shorter than the time DEC has given for ending support of the 20s. A lot of people are saying that their particular application will not be in existence at that time anyway, so they can live with it on the 20."

After becoming more aware of this issue through the seminar, the team has decided to change its approach. Instead of setting a definite deadline for shutting down the 20s, it is moving gradually and hoping the conversion of new applications to the VAXs will help convince users that a change is taking place.

"It brings to light a realization of the

THE ROAD TO SUCCESSFUL SOLUTIONS



The path to success begins at INTERFACE. And this year's will be the best and biggest show yet in the illustrious history of this event, featuring over 360 exhibitors, a 70-session success-oriented conference and much more. And it's just weeks away!

For the fifteenth consecutive year, the executives responsible for their organization's communications and information networks will find the solutions they seek at INTERFACE.

Here's why:



- Keynote Address: Sen. Timothy E. Wirth, former Chairman of the Subcommittee on Telecommunications, Consumer Protection and Finance, will discuss "Information Resources Integration: Survival Strategy for the Next Decade."
- The INTERFACE conference, the world's leading forum of technology, trends and tactics, this year featuring over 70 strategically targeted sessions.
- Over 360 companies in the nation's largest exposition of communications and information networking products.
- An Executive Briefing for information executives who use communications and information resources as strategic management tools.
- The Annual INTERFACE Industry Awards Banquet, honoring outstanding contributions in the communications field. Entertainment will be provided by popular comedian/magician Harry Anderson of TV's "Night Court." Don't miss this gala evening of dinner, dancing and entertainment.



Take the road that leads to success. Plan now to find your solutions in Las Vegas at INTERFACE '87. Registration begins on Sunday, March 29th.

INTERFACE '87

March 30–April 2, 1987
Las Vegas Convention Center

Produced by
THE INTERFACE GROUP, Inc.

Co-sponsored by
[illegible] and [illegible]

© The Interface Group, Inc.

human part of the project. We can't just look at our own tasks. We have to look at those people we're trying to change to see what their needs really are," Young says.

After the general needs of the user population are identified and addressed, the next step in the O. D. Resources' approach is to examine the key roles of those involved in the project.

Players and their roles

According to the seminar instructors, each project has three critical players: change sponsors, one or more change agents and change targets. The sponsor legitimizes the change, while the agent implements it, and the targets actually change their behavior to accommodate it. In addition to these three basic roles, those involved in the project can also be change advocates. The goal is to turn as many members of the target population as possible into change advocates.



McDonnell Aircraft's Ken Link: *"I need to bring out a strong level of commitment."*

Perhaps the most crucial role is played by the sponsor. To emphasize this, the seminar establishes the following sponsorship guidelines:

- Significant change within the target population will not occur without sufficient commitment demonstrated by the appropriate sponsors.
- When sponsors fail to understand the implications of the change, are unwilling or unable to take the necessary actions to secure resources or cannot fulfill their role requirements, they must be educated or replaced, or else the change effort will fail to meet its stated objectives.
- Sponsorship cannot be delegated. The change agent cannot function as the authority that approves the change.
- There are two kinds of sponsors: Initiating sponsors and sustaining sponsors. Initiating sponsors possess the organizational wherewithal to order that the change take place, and sustaining sponsors wield the logistic, economic and political clout to maintain the change process.
- Cascading sponsorship should be established. This is a process in which the initiating sponsor directly passes active support of the project on to sustaining sponsors. This process ultimately creates sustaining sponsors within the target population. If the department head in a user organization is a leading sustaining sponsor of change, the chances of success within that department are very high.

To help project managers assess the level of sponsorship, the seminar requires that they work with the sponsors in their companies to identify the goals of the project. In addition, each participant is given an evaluation form that numerically ranks sponsor commitment based on 13 criteria, including the sponsor's dissatisfaction with the present state, his public role in the change and whether he will provide sustaining support. Ranked on a scale of one to 10, these factors are then plotted on a graph. A significant number of responses in the one through four areas of the scale indicates a low level of sponsor commitment and little chance that the change will be accomplished effectively.

Evaluations of this sort cause the project managers to stop and think very carefully about how much support they have from the top. One of the participants in the seminar, Joanne Stachura, manager of the personal computer learning center at Continental Illinois National Bank in Chicago, decided to reconsider her project after assessing the sponsorship. Her project involved introducing computer-based training to take the load off of classroom instructors. If it had been implemented, the project would have helped teach about 1,000 bank employees the intricacies of a new demand-deposit system.

"One of the things I learned in the seminar was to make sure you have sufficient sponsorship for the project before you invest a lot of time in it. I found out right at the beginning that we just didn't have the sponsorship at this point in time to continue. So we have set the project aside for a while," Stachura says.

In Stachura's case, the sponsorship was lacking in the form of financial resources to sustain a large-scale operation. "Because of the economic conditions right now and because we had to shift resources to different areas, it was felt that we couldn't invest the time or the personnel to move forward," she says.

Ensuring that sufficient sponsorship is present to accomplish the project is also a concern of the 3M team. McDonald says, "The first thing we worked on when we got back to the office was the importance of sponsorship and defining the duties of the sponsor as opposed to the duties of the change agent. We didn't even know that there was a difference. Just finding out what those responsibilities were and trying to apply them to our project was very important."

Because of sponsorship evaluation,

ONLY
INTELLECT/DB2
DELIVERS IMMEDIATE
ANALYSIS OF DB2 DATA

Easy data access isn't enough. So managers use INTELLECT/DB2 for ad hoc analysis of DB2 or SQL/DS data in plain English. They access totals, minimums, maximums and percentages, perform complex functions such as correlations on their own, and see results automatically displayed in summary or graph form.

INTELLECT/DB2 combines the power of DB2 with INTELLECT, the AI-based natural language software used by over 450 organizations worldwide. INTELLECT/DB2 enhances your investment in DB2 by giving managers conversational English access to DB2.

"INTELLECT/DB2 saves time and increases productivity because managers can access and analyze complex data on their own, in plain English."

Assistant Director, Computer Services
Arkansas Department of Education, MSRTS

Ad hoc analysis is one of six requirements for delivering DB2 to management—and only INTELLECT/DB2 meets all six. Attend a free seminar and find out how INTELLECT/DB2 can deliver DB2 to your management.

1. NATURAL LANGUAGE
INTELLECT/DB2's advanced AI techniques let managers use everyday English to access DB2 data.

2. AD HOC ANALYSIS
Managers can access analytical and statistical functions as needed.

3. APPLICATION BUILDING
Within DB2's security constraints, managers can create and update tables, build forms for data presentation, and request reports

4. PROPER USE OF DB2
As an SQL generator, INTELLECT's interface to DB2 optimizes SQL coding for maximum efficiency. And an "Instant English" facility automatically reads your DB2 database to get you started quickly.

5. OPEN ARCHITECTURE
Use DB2 or other databases and file structures in many ways. With our PC Link, reformat DB2 data into a Lotus 1-2-3 worksheet and send it to a PC.

6. THE RIGHT VENDOR SUPPORT
Our 11 years of delivering commercial AI solutions means you get fast, expert help and complete product support

Find out how you can use AI to deliver DB2 to management. Call our Seminar Registration Office today at (617) 890-8400, or return the coupon.

Boston	April 8
Cleveland	March 12
Dallas	February 25
Denver	March 19
Detroit	March 5
Hartford	March 18
Minneapolis	April 2
New York	April 15
Philadelphia	March 3
Sacramento	March 26
San Francisco	February 24
San Jose	March 11
Toronto	April 9
Washington DC	February 26
Washington DC	April 16

CALL (617) 890-8400

☐ I'll attend a free INTELLECT/DB2 seminar
City _____ Date _____
I can't attend but send a brochure
Name _____
Title _____
Company _____
Street _____
City _____
State _____ Zip _____
Telephone ( ) _____

INTELLECT is a trademark of Artificial Intelligence Corporation. DB2 is a registered trademark of IBM. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation

AICorporation
USING AI TO DELIVER INFORMATION TO MANAGEMENT

Artificial Intelligence Corporation 100 Fifth Avenue, Waltham, MA 02254-9156 (617) 890-8400. Telex 989606

the team discovered that they were attempting to implement the project without the full commitment of top MIS management. "Upper management was aware of what was going on and was voicing support. But essentially, they were acting in a passive role of listening and okaying what the team was doing but not necessarily carrying the story on to other people at their level," McDonald says.

Following the principles outlined in the seminar, the team is now educating 3M executives in the ramifications of the project and the role of the sponsor. Daryl Conner, president of O. D. Resources and the originator of many of its concepts, went to 3M's St. Paul, Minn., location to demonstrate the importance of cascading sponsorship.

User department sponsors

The 3M team is also planning to reach out to user departments to find sustaining sponsors. "Now we're looking at getting our internal sponsorship in line first and then moving out to the division. We have cultivated some primary users in our target population to help us with the sponsorship," says Sue Gilbertson, senior analyst for the team.

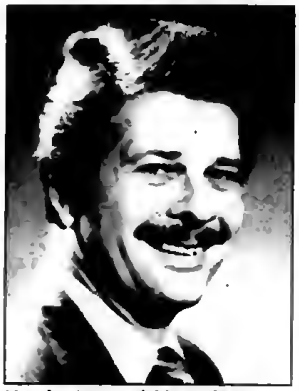
"Once sponsorship is secured, the change agent can begin focusing on the strongest sources of resistance within the user population. Back at McDonnell Aircraft, Link has identified the main source of resistance among the middle-level managers.

Developing the computer-aided logistics system will require some managers to give up some of their power and influence because they will have to relinquish control of information that resides in their departmental data bases.

"In an organization of this size, communication is a major factor, and those who possess the current real-time information typically find themselves in somewhat of a power broker position," Link says. "When you move the responsibility for that information from one function to the next, it not only shifts what tasks these managers do, but it also shifts the power position in terms of who has the current information.

"It is a pure turf issue," Link continues. "One function will have to give up some ground, and the other will have to take on some additional responsibility. Some of the hard-core resisters to the project are in the areas that have to give up turf."

Seminar principles regarding the nature of the user population have helped Link to more readily see the obstacles presented by those managers who are protecting their turf. "If some of the hard cores are in some very key spots, then there is a population that gets caught in the cross fire. The users see the need for doing something different, yet they know their own management is nonsupportive of it. They're not going to stick their necks out too far," Link says.



Merck's Leonard Olen: *"I am making an effort to emphasize feelings."*

To address this problem, a useful seminar concept is the idea of "melting resistance." Rather than attempting to force the hard-core resisters to accept the change, Link is dealing with them one on one, trying to change their frame of reference gradually so that change looks more positive than status quo. "I'm trying to find out: What are their concerns?" Link says.

"What are the real issues that they're hung up about? Why can't they recognize the need for change and have some level of commitment toward it? The most optimistic result of this is that you get to a juncture where you can make a breakthrough with one of these individuals. Then you can start defining things in ways that allow them to start accepting the change," he says.

Unfortunately, a breakthrough cannot always be reached. In that case, Link says, there are two choices. "If they're in a key position, you have to decide whether you can tolerate keeping that person in that key position, recognizing the effect it may have on other people's support and commitment. If you can't, then you've got to look at other alternatives that satisfy the good of the whole as opposed to a single individual," he says.

In addition to evaluating the sponsors and the users, the seminar provides tools to allow the project managers to look objectively at their own skills and communication styles. Evaluation forms provided at the seminar identify four major communication roles that people adopt in work or life situations:

- Intuiter: conceives, projects and induces. At his best, this person is a leader and a visionary who can see the center of the problem, At his worst, be may be seen as long on vision and short on action because he avoids the nitty-gritty tasks.
- Feeler: relates to and understands experience through emotional reactions and responses to feelings. A patient, empathetic listener, this person can be perceptive and aware or insightful. However, this person's tendency toward emotionalism can make him seem more concerned with the process, rather than the content, of a project.
- Senser: experiences reality mainly on the basis of his own sensory perceptions. This person can he a dynamo who is totally committed to a task or he a well-organized and resourceful

DOS, OS, or CICS Frustration?

BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

BIMWNDOW — Multiple terminal sessions concurrently at CRT under DOS or OS VTAM.
BIM-EDIT — The editor with more than 25 significant features that ICCF can't match.
BIMSPOOL — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982)
BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.
BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.
BIM-ODIS — Comprehensive problem analysis and display of operational CICS system. DOS and OS.
BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input. DOS and OS.
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. DOS and OS.
BIM-FMAP — CICS BMS on-line map generation and maintenance. DOS and OS.
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration.
BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer.
BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.
BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
BIMSUBMT — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, some less than $900, highest $4800. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4331-2 system, on-site or remote.

BIM
B. L. MOYLE ASSOCIATES, INC.
5786 Lincoln Drive
Minneapolis, MN 55436
612-933-2885
Telex 297 893 (BIM UR)
Member Independent Computer Consultants Assn



individual. But he may also fail to consider the long-range consequences of his actions. This person may be so action-oriented that he skips important steps in the process.

• Thinker: analyzes and orders life in a logical fashion. A consistent force for progress, this person is at his best when cutting through emotion and untested ideas to get to a planned, orderly solution. At his worst, this is an overly cautious and conservative individual who emphasizes deliberation instead of action.

Answering a series of questions in the seminar's communications style evaluation form yields scores, which are then plotted on a grid. The grid shows the major personality types toward which each participant leans.

Another seminar participant, Leonard Olen, personnel data systems manager at Merck, a Rahway, N.J., pharmaceuticals company, found the analysis of communications styles particularly useful in his efforts to address user concerns about his project.

> THE analysis trains project managers not only to look at their own personalities but also to use other communications styles to get their points across.

Olen and his staff are installing an automated personnel records system that replaces paper files with computer terminals connected to a mainframe. Olen found that he tended to be more logic-oriented and therefore less sensitive to emotions.

He says, "Realizing that the emotional side of my communications style is very low, I am making an extra effort to emphasize feelings in dealing with the people who are going through this change."

Group therapy

The analysis also applies to the user population. If a project manager is trying to advocate a change using a communications style opposite to the one predominant in the user population, it will be more difficult to convince the users of the need for change. So the communications style analysis trains project managers not only to look at their own personalities but also to use other communications styles to get their points across when necessary.

Being sensitive to the various styles within the end-user population has allowed Olen to match his project implementation approach more closely to the needs of the users.

"One of the problems we have in a company this size is that if you start doing things with groups of people, the second and subsequent groups feel like they're second class because all the design considerations were handled with the first group," Olen says.

"I avoided that approach. Instead, we sat down with each new group and tried to figure out where they were coming from and how they were using the data, almost like it's a whole new system," he adds.

After evaluating all the aspects of change, the project manager is well prepared to realistically evaluate the chances for success. The positive signs are high sponsor commitment, low or reduced target resistance and an aware, skilled change agent. Negative signs that mean the project is headed for disaster are low sponsor involvement, high and intractable resistance and inadequate change-agent skills.

In Link's case, the sponsorship is strong, and he has become more aware of what he needs to do as a change agent. Keeping the principles of change management at hand has helped him to pinpoint the sources of resistance and develop tactics to address them. "I feel I have a much better comprehension of the psychology of getting people to accept the change and assessing whether they're going to accept it," Link says. "This is going to allow me to do some things up front in the development process that maybe I would not have thought of until I got downstream and the problem had already surfaced." •

SCIENCE/SCOPE®

Improved access to a new generation of giant Intelsat satellites is planned. Intelsat VI, designed and built by Hughes Aircraft Company, is a series of five of the world's largest, most powerful commercial communications satellites. Each will have the capacity to carry 120,000 telephone calls and at least three television channels simultaneously. Making this possible is the use of very advanced digital modulation techniques. Design changes, the result of a system modification contract from the International Telecommunications Satellite Organization (INTELSAT), also will more than double the downward signal capacity of the satellite's spot beams, permitting greater coverage of North America and more connections with Europe. Called the satellite of the 21st century, each satellite in the Intelsat VI series stands 39 feet high and will use terminals as small as two feet in diameter. The first Intelsat, built by Hughes more than 20 years ago, was 4½ feet high and required Earth terminals nearly 100 feet in diameter.

A unique computerized visual system helps military forces simulate battlefield terrain. The system provides unusual realism and flexibility to help with a wide range of training and mission planning requirements. It can generate lifelike three-dimensional scenes from a computer database created with aerial photography. Pilots can use the system for nap-of-the-earth flight training, even to the point of seeing simulated radar and infrared displays. The Hughes system also can be used for intelligence analysis and team tactics training.

Explosive fuel fires inside tanks and armored vehicles can be snuffed in a blink, well before the explosions could injure crews or damage equipment. The Dual Spectrum® fire sensing and suppression system, developed by the Santa Barbara Research Center, a Hughes subsidiary, utilizes sensors set to look for flashes in two distinct infrared wavelengths. At the start of an explosion, the system triggers the release of a gaseous liquid substance. The snuffing occurs in one-tenth of a second—less than half the time it takes the human eye to blink. Dual Spectrum systems are now carried by or in production for the U.S. Army's M1 Abrams main battle tank, the Army's Bradley Fighting Vehicle System, the U.S. Marine Corps' AAV7A1 amphibious personnel vehicle, and the Korean XK1 tank.

A hand-held infrared viewer helps reduce losses for a large insurer of boiler machinery. Insurance company engineers use Hughes' Probeye® infrared viewer to survey plants of applicants and policyholders. The Probeye viewer sees heat the way a camera sees light, converting it instantly into an image seen through the eyepiece. Inspectors check for potential hazards in piping systems, electrical connections, and pressure vessels. Infrared viewers are valuable tools for paper manufacturers, too. Moisture in paper sheets must be monitored continually during processing, since sharp differences can result in serious defects. The viewers pick up temperature changes caused by varying moisture conditions, enabling operators to stop the process and make corrections.

Hughes needs engineers, scientists, and programmers to forge new frontiers in aerospace radars, weapon control systems and avionics, airborne displays, aerovehicle data links, and airborne countermeasures. Current openings are for people experienced in design, development, test and manufacture for systems engineering, project/program management, design of circuits and mechanisms, and bringing these to reality through the application of advanced manufacturing techniques. Send your resume to Hughes Radar Systems Group, Engineering Employment, Dept. S3, P.O. Box 92426, Los Angeles, CA 90009. Equal opportunity employer. U.S. citizenship required.

For more information write to P.O. Box 45066, Los Angeles, CA 90045-0066

© 1987 Hughes Aircraft Company

HUGHES

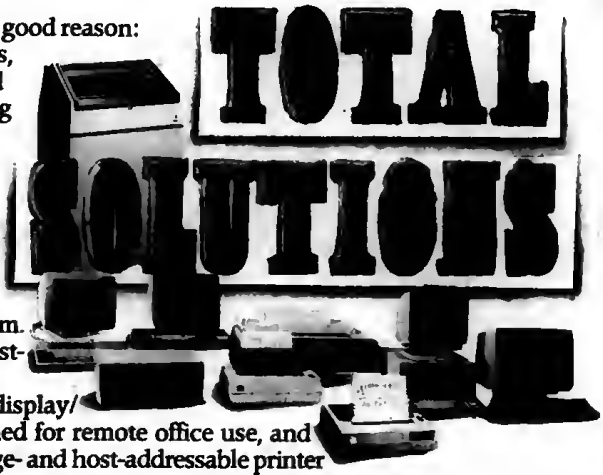
Subsidiary of GM Hughes Electronics

Choose the 3270 alternative that gives you more choices.

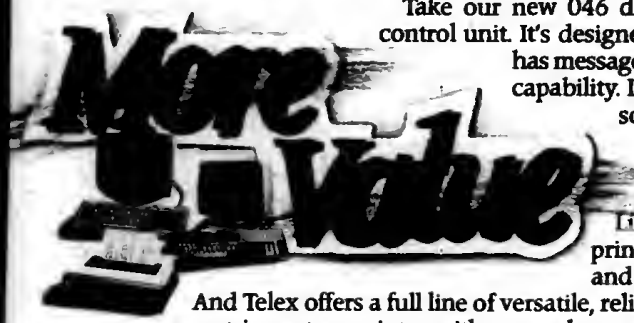
Choose Telex. We're the #1 3270 alternative for a very good reason: our choices give you more solutions. Like our displays, with a variety of screen sizes and color options. And faster, quieter printers for all applications, including 3270, S/3X and airline.

Better still, we offer some value-added enhancements that IBM doesn't even offer at all! Like control units with windowing capability.

Big office or small, whatever your business, Telex 3270 compatibles provide more solutions to your problems, whether you need displays, printers, intelligent workstations, control units or an entire system. And Telex upgradeability helps you protect your investment for the long run, too.



Take our new 046 display/control unit. It's designed for remote office use, and has message- and host-addressable printer capability. It's another example of a unique Telex 3270 terminal solution.



Telex 3270 products are competitively priced. But the competition's left in the dust when it comes to features. And that spells value.

Like our new low-cost 191 display. It has a smaller footprint and offers unique options like a message printer port and a light pen.

And Telex offers a full line of versatile, reliable printers. Including the new economical 187 dot matrix system printer with monochrome and color capability. And the new Telex 262 high speed (600LPM) line printer.

Our combined function terminal series is made possible by our integrated technology. Our C078 and our new four-color C179 have user-defined function keys, portable memory, up to seven windows and built-in telephony. Our 274 control unit now has windowing capability to complement its Multiple Logic Sessions (MLS) feature. Our competition doesn't offer that, either.



Telex dedicated service and support are the envy of the industry, with over 2,000 technical and service personnel worldwide, at your beck and call 24 hours a day.



Telex is #1 in product choices, #1 in overall customer solutions, #1 in value and #1 in support. Which makes us the #1 choice in 3270.

For more information, call Telex. USA: 1-800-331-2623, Ext. 3284. (Oklahoma, 1-918-628-3284). INTERNATIONAL: 1-617-769-8000. CANADA: 1-800-268-3233. EUROPE: 41-38-22-6101.

The #1
3270 Alternative

TELEX

TELEX COMPUTER PRODUCTS, INC.

IBM is a registered trademark of International Business Machines Corporation.
Telex is a registered trademark of The Telex Corporation.

INTRODUCING CULLINET IDMS/87.

WHAT'S NEW AND WHAT IT MEANS TO YOU.

IDMS/ARCHITECT

Advanced integrated computer-aided software engineering (CASE) tools make database and applications easier to use.

IMPLEMENTATION WORKBENCH

"Expert" tools make applications easier to implement.

3x3 ARCHITECTURE

Provides consistency and connectivity of database, applications and end-user tools across mainframe, departmental and personal computers.

IDMS/87

Makes your technology investment easier to justify.

ACCESS T
TECHNOLOG

IT'S EASY TO USE.

IT'S EASY TO







DATABASE

Cullinet's new database products support all applications – small and large, simple and complex – to improve productivity and guarantee data integrity.

- High-transaction processing is enhanced with comprehensive MIS and end-user development tools.
- Delivers database products for connectibility across mainframe, departmental and personal computer architectures.
- Features an integrated data dictionary that ties together multiple data sources and supports SQL.
- Completely automatic backup and recovery requiring absolutely no human intervention. Recovers and re-establishes all transactions as well as data integrity.

NEW IDMS/ARCHITECT

Now Cullinet offers the only family of computer-aided software engineering tools that integrate both database and applications design.

- Dramatically improves design quality, shortens development time and automates documentation – all with reduced MIS manpower resources.
- Integrates database, fourth-generation development tools and applications.
- Mouse-driven, graphics-based intuitive interface delivers the ultimate simplicity in applications and database design.

APPLICATIONS

Integrated business applications now in use by over 2500 customers form the core of your successful information strategy.

- The Cullinet Manufacturing System lets you plan, control and react to real-world changes in the manufacturing cycle, worldwide. And now for government contractors, the system offers project management, bid tracking and funds management in compliance with DOD reporting standards.
- The Cullinet Financial System delivers on-line financial control to maintain current information accurately, efficiently and securely.
- The Cullinet Human Resources System gives you a complete personnel management and payroll processing capability.
- New financial and manufacturing functionality extend Cullinet's application solutions.

THE NEW
GY OF IDMS/87

D IMPLEMENT.



NEW IMPLEMENTATION WORKBENCH

Cullinet's new "expert" implementation tool dramatically reduces applications installation time and assures project success.

- This top-down, PC-based implementation aid and project management tool provides training, customized, on-line documentation and data conversions for Cullinet applications.
- Fits Cullinet manufacturing applications to the way you do business.
- "What if..?" implementation modeling and planning can be simulated.

IT'S EASY TO JUSTIFY.



NEW 3X3 ARCHITECTURE

Cullinet's comprehensive circumference strategy spans mainframe, departmental and personal computers for unmatched system integration.

- Database products, fourth-generation business applications and information center tools are engineered to work together providing total corporate computing solutions.
- SQL provides a point of compatibility across a three-tiered platform.
- Distributes uniform database products, applications and decision support throughout your organization's personal, departmental and mainframe computers.
- Integrates and provides connectibility between the DEC VAX – the world's leading departmental computer – and your IBM mainframe.



NEW BUSINESS CASE

Cullinet has done extensive research and quantified the vanables, making it easier for you to implement your information system strategy.

- Cullinet's business-planning models spotlight specific benefits of an information system design.
- These models help evaluate the costs associated with the "buy vs. build" decision.
- An informative white paper detailing the economics of information systems strategy is available to help you examine the ROI of your information system.

Cullinet

An Information Technology Integrator
For The 80s, 90s And Beyond

ACCESS IDMS/87 TECHNOLOGY AT THE CULLINET TELEVIDEO CONFERENCE.

All the excitement of IDMS/87 will come to you in an equally exciting format this spring.

On March 31, twenty-two cities will be joined via a video hook-up. And you're invited to participate.

See, hear and experience IDMS/87 technology first-hand. It's a televideo orientation session that's well worth attending. The IDMS/87 Spring Televideo Conference provides a unique format for you to learn about the latest Cullinet software developments.



You'll talk with Cullinet Software experts who will tell you how to make successful implementation a reality.

You'll hear from senior executives at Cullinet about industry trends and the tangible benefits of computer-aided software engineering tools available to your corporation today.

And you'll join in local workshops and demonstrations of exciting new IDMS/87 technology.

Return this form or call Cullinet today at (800) 551-4555. In Massachusetts, call (617) 329-7700.

Cullinet

An Information Technology Integrator
For The 80s, 90s And Beyond

☐ Reserve a place for me at Cullinet's IDMS/87 Spring Televideo Conference to be conducted on March 31, 1987.
☐ Send more information on Cullinet IDMS/87 technology.
☐ Have a Cullinet Sales Representative call on me.

NAME: _____

TITLE: _____

COMPANY: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

PHONE: _____

MANAGEMENT

TAKING CHARGE



Jeffry Beeler

MIS has its insiders too

When arbitrageur Ivan Boesky pleaded guilty recently to charges that he traded inside stock information, he was banished from Wall Street forever.

When attorneys further their own welfare by acting contrary to their clients' best interests, they risk disbarment and face the possibility of permanent expulsion from their chosen livelihood.

When psychiatrists wheedle sex from their emotionally vulnerable patients, they can lose for all time their licenses to practice medicine.

Practically every profession truly deserving of the name not only quires its members to abide by a strict, written code of ethics but establishes standard procedures for enforcing these rules as well as for disciplining violators.

One notable exception is information systems, even though the field almost surely entails as much of a position of public trust as bona fide professions such as accounting and law.

Programmers or other systems specialists who tamper with their employers' data or electronically embezzle a company's funds are subject to the

Continued on page 63

J. C. Penney melds DP, television

Plans interactive cable TV shopping by summer

BY DAVID A. LUDLUM
CW STAFF

J. C. Penney Co. plans to open up a new sales channel — television — with a strategy built on an innovative marriage of data processing, networking and cable TV technology.

Penney's home shopping service, which it plans to test with about 125,000 homes in the Chicago area this summer, is menu-driven, like videotex, but is delivered via cable TV and accessed and manipulated with a Touch-Tone telephone.

The service, dubbed Telaction, relies on still video screens, which can be delivered rapidly to approximate animation. Penney decided that delivery of interactive, full-motion video would be prohibitively expensive, according to Stuart C. MacIntire, president of Telaction Corp. in



Stuart MacIntire

Schaumburg, Ill., a wholly owned subsidiary of Penney that is developing and operating the service.

Based on experiences with videotex systems, Penney designed Telaction on the principle that the home shopper should not have to acquire equipment such as a terminal or PC. "Needing extra equipment is a deterrent," Penney spokesman Duncan Muir says.

Customers will receive Telaction through a cable TV channel included in a basic service package and will be able to access it with a local telephone call, using an identification number based on a credit card account.

The service also differs from many videotex systems by focusing on merchandising rather than banking and other information-based services. 'It'a going to be very much of a marketing or merchandising activity," MacIntire adds.

Penney's plan reflects the growing popularity of home shopping via television and a more established trend toward alternative channels of retail distribution, particularly catalogs. The developments stem, in part,

Continued on page 60

Management insecure about security measures

BY ALAN ALPER
CW STAFF

NEW YORK — While senior management teams in most organizations are becoming more aware of data security requirements, few managers are confident that the safeguards they have already taken are adequate.

This is one of the major findings released last week by Cleveland accounting and consulting firm Ernst & Whinney from its second annual survey on computer security issues.

Of the survey respondents, 62% indicate they believe that security risks are rising and 75% say they are taking substantial steps to implement security policies. Only 6%, however, say security measures taken by their organizations have been adequate.

"Awareness of the issues is on the upswing," says Toni Fisher, co-director of Ernst & Whinney's Information Security Services Group. "But as is the case in many areas, awareness is one thing, implementation is another."

Yet the issues of security and contingency plannning have become basic management concerns. "Today, more senior management people are involved," notes Dave Wilson, national director of Ernst & Whinney's Information Services Group. "It has become a major part of running the business. It's no longer an ancillary aspect."

Organizations that have addressed disaster recovery are usually more apt to have established data security procedures, according to the firm. Unfortunately, Fisher says, most companies have adopted the "Scarlett O'Hara Plan — I will think about it tomorrow."

The survey, which will be published in April, polled 1,000

Continued on page 61

Irish woo software operations

BY DAVID A. LUDLUM
CW STAFF

Just in time for St. Patrick's Day. The Travelers Corp. is set to join a trickle of U.S. corporate computer users that are setting up on-line software development or maintenance facilities in Ireland.

The trend, aided by Ireland's 5-year-old digital telecommunications network, follows widespread use of overseas software facilities by U.S. computer vendors and the popularity of offshore data-entry operations among users.

However, it is relatively innovative for a U.S. computer user to do on-line software development overseas, according to John O'Brien, vice-president of research and marketing for Ireland's Industrial Development Authority (IDA).

"It'a a very attractive place for computer companies, and now we're beginning to get people who are computer users . . . to set up software development and maintenance facilities," O'Brien said. "The next area of expansion, the big area we see for expansion, is development by computer users."

American Airlines has investigated establishing a software facility in Ireland, according to an airline spokesman, and the IDA is talking with a number of other U.S. user companies about opening software facilities and data centers, O'Brien said. "We're in the business of attracting data center services as well as development," he noted.

Continued on page 65

Boosts in '87 systems budgets paced by personnel

Major computer users will boost spending on information systems an average of 5% this year, although more than 15% of the users will cut the outlays, according to a soon-to-be-published survey of nearly 500 organizations.

Among the 473 respondents that indicate a direction for the information systems budget, 57% project an increase, with the portion higher among larger organizations. A reduction is projected by 16%, and no change is projected by 27%.

However, estimates of growth or contraction vary considerably by industry and budget components, according to a draft of the survey, which was conducted at the end of 1986 by International Data Corp. (IDC) in Framingham, Mass.

Among budget components, nearly half the respondents (49%) project increased spending on salaries and benefits. Areas commonly targeted for reduced spending are hardware, for which 22% project cuts, and outside services other than service bureaus, for which 20% foresee declines. Service bureau spending is projected to be relatively stable.

Among industries, those that foresee the largest increases in overall information systems spending are financial services (19%), insurance (13%), banking (6.6%) and nondurable manufacturing (5.2%). The only projected decrease is among a group that combines agriculture, mining and construction, in which an 8.6% decline largely reflects cutbacks by major oil companies, according to IDC.

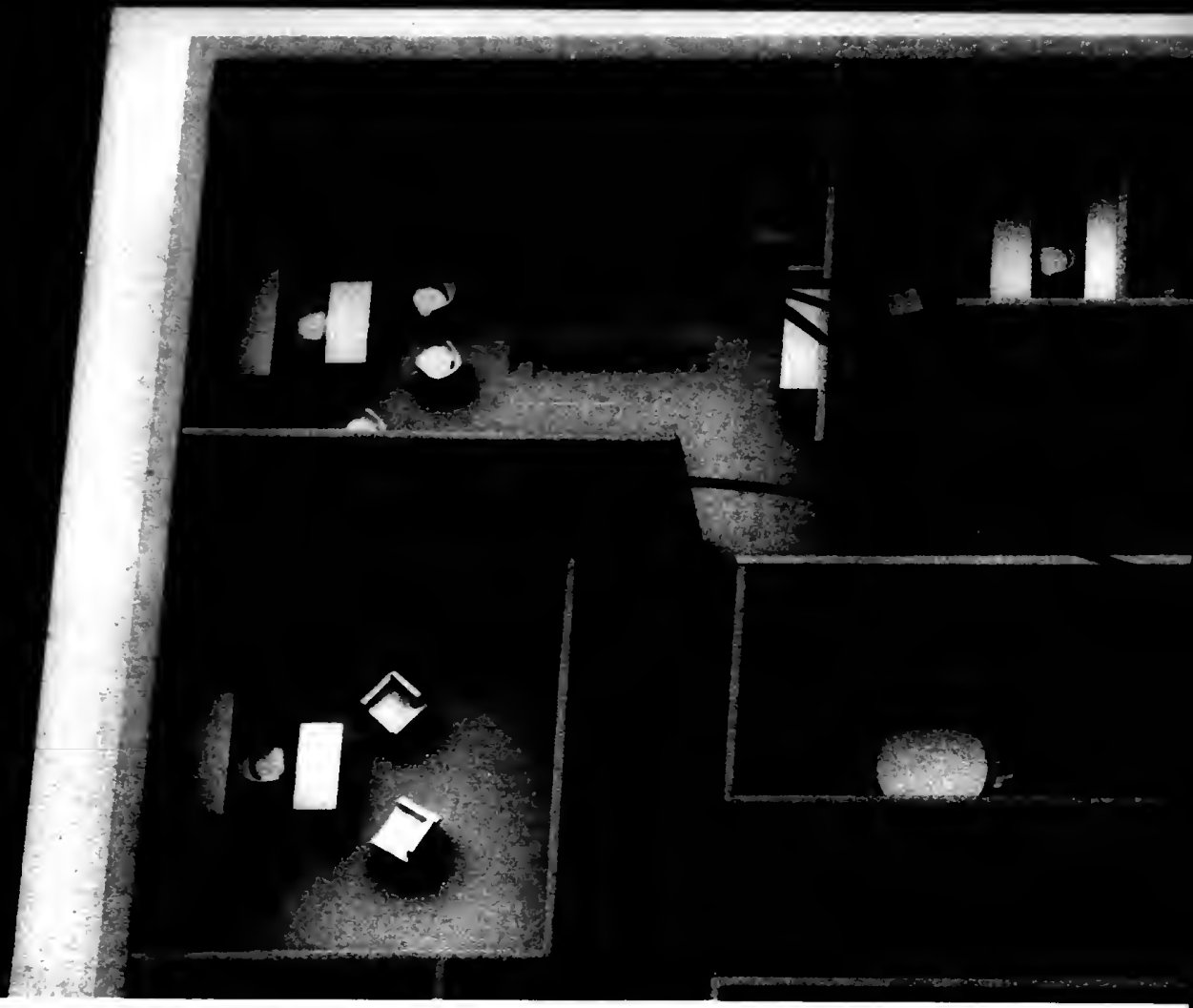
Areas of low projected growth in information systems spending include state and local government (no change), health services (0.5%) and transportation and utilties (1.4%).

Salaries and benefits will form the largest component of information systems budgets at 39%. That represents a decline from 43% in 1984, which reflects the growing volume of information systems work done by end users outside of MIS budgets, according to IDC. Meanwhile, the portion of budgets spent on communications has risen from 7.7% to 9.7% with decentralization of information systems, IDC reports.

Hardware, at 29%, is the second largest budget item in the recent survey, after salaries and benefits. All the other factors account for less than 10% each. The total information systems budget will account for an average of 1.3% of the organization's total revenue, the survey says.

In November and December, IDC surveyed 4,000 manufacturers with annual information systems spending of $250,000 or more as well as 6,000 service organizations. It received responses from 751 of those surveyed. Growth in information systems spending was calculated only among the companies with a fiscal year ending in November, December or January.

OUR NEW PINWRITER WHERE NO OTHER MATRIX



The executive suite. Until now, dot matrix printers just weren't welcome there.

They were too noisy, for one thing. But even more important, they couldn't deliver the quality top executives demand.

Dear Stockholder:

Actual print sample
from a Pinwriter P9XL printer.

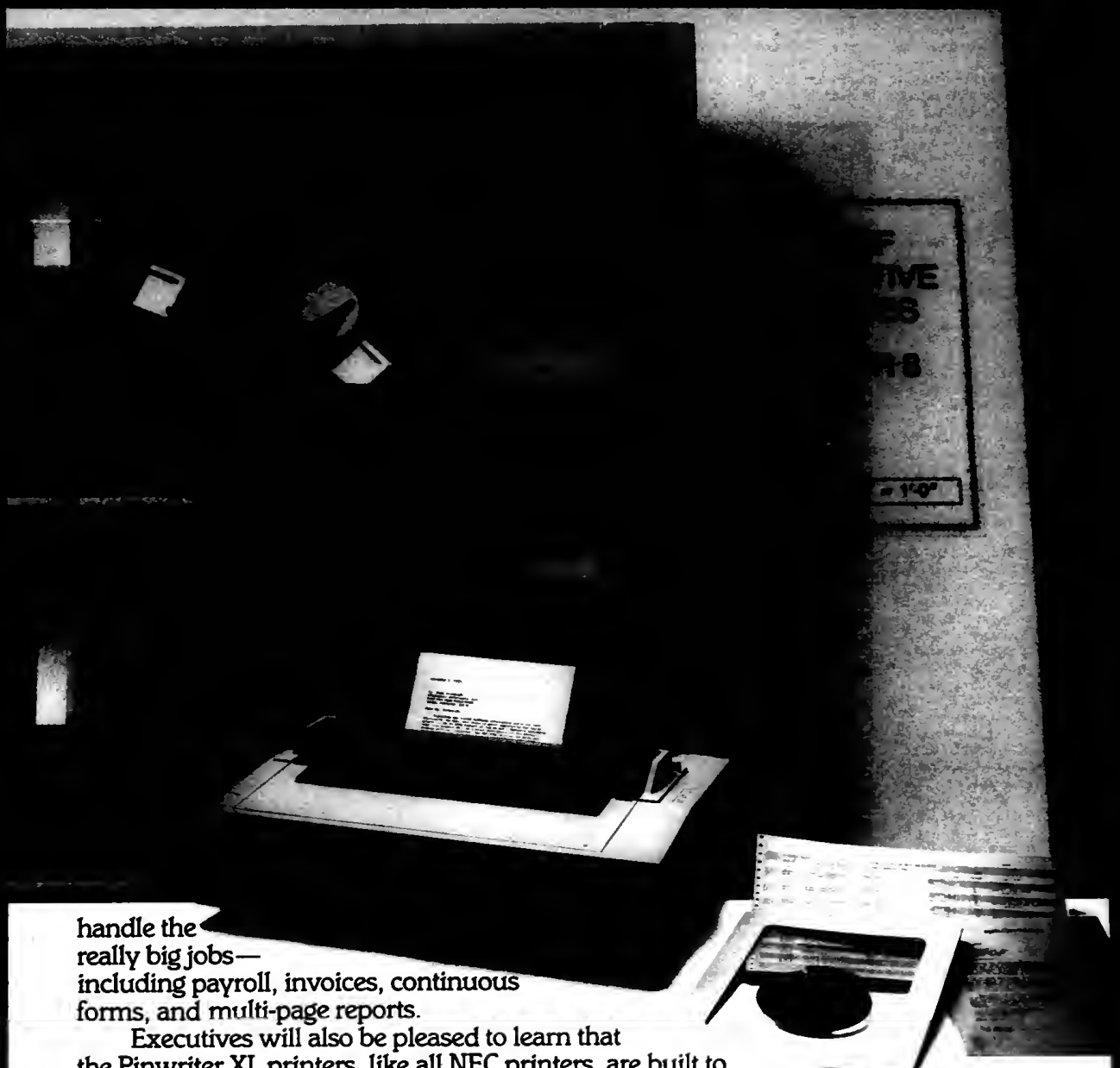
But now there's the XL series from NEC.

Our Pinwriter® XL series printers have multistrike film ribbons that produce true letter-quality documents—the kind any executive would be proud to sign. They print in 8 different colors—on paper or transparencies—to make charts, graphs and executive presentations more impressive. And they're the quietest matrix printers you've never heard.

They're also fast. Take our new Pinwriter P9XL, for example. It's over 30% faster than most other printers in its price range, with nearly twice as much memory to

C&C Computers and Communications

XL SERIES BOLDLY GOES PRINTERS HAVE GONE BEFORE.



handle the really big jobs—including payroll, invoices, continuous forms, and multi-page reports.

Executives will also be pleased to learn that the Pinwriter XL printers, like all NEC printers, are built to run an average of 5 years before they might need a repair. In fact, they have the highest reliability ratings in the industry.

So make an executive decision. Call 1-800-343-4418 (in MA 617-264-8635) and ask for the name of the NEC dealer nearest you. Or write to NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

J. C. Penney

FROM PAGE 57

from growth of two-income households, which have money to spend but relatively little time to shop, observes Jay Rowell, Telaction's vice-president for corporate planning.

In addition to sales of its own merchandise, Penney's expects the system to generate earnings from sales of products and services of other companies, including specialty retailers, grocers and travel services.

Telaction employs Tandem Computers, Inc. VLX and TXP fault-tolerant hosts in Schaumburg, which are fed cable subscribers' telephone calls and instructions by modified AT&T devices called telephone management units.

The computer directs central display units to connect with proprietary, interactive "frame grabbers" mounted on cable system lines, which select the requested screens and route them to the proper subscribers.

Plans call for one frame grabber to serve about 15 cable subscribers. Only one of those 15 could use the system at one time. At that rate, Penney's estimates that a subscriber could get on the system with no delay about 85% of the time, Muir says. If a subscriber's neighbor was using the system, he would see what the neighbor was viewing when he tuned in the Penney's channel.

Citing concerns with confidentiality, Telaction officials declined to comment further on the technology until the company issues a formal statement.

The interactive cable TV technology has been developed by a Canadian company, Cableshare, Inc. in London, Ontario, which has licensed it to Telaction, MacIntire says. Penney's currently owns 36% of Cableshare's stock.

Assuming Telaction succeeds, Penney's expects to install the service in 20 major markets within "a couple of years" and in about 60 markets within five years, Muir projects. "Our intention is to go nationwide," he adds.

The company has budgeted about $40 million for developing the service, including the Chicago-area test, and "it remains to be seen how much we're going to spend from there on in," Muir says.

Penney's, which is based in New York, set up its Telaction subsidiary in March 1986 on the basis of technology purchased from First Bank System, Inc., a Minneapolis-based bank holding company.

First Bank System tested a videotex service based on the French Minitel terminal with 300 farm homes in North Dakota in 1982 and 1983, a project joined by 42 retailers and other merchants, including Penney's.

Even before the trial, the banking company suspected that use of special equipment was an obstacle to acceptance of electronic home services, says MacIntire, formerly a senior vice-president for marketing at First Bank System.

"We had already made the decision that home banking by itself was rather dull and that, by itself, home banking would not be very successful. It is just pure information," he adds.

Of the 300 families with whom the videotex system was tested, 60 had purchased a personal computer — independent of the test — but only one was using it, MacIntire says.



9-TRACK TAPE OCR SCANNING WP CONVERSIONS FOR YOUR PC

For thousands of customers, we supplied a low cost connection to get information into their PC

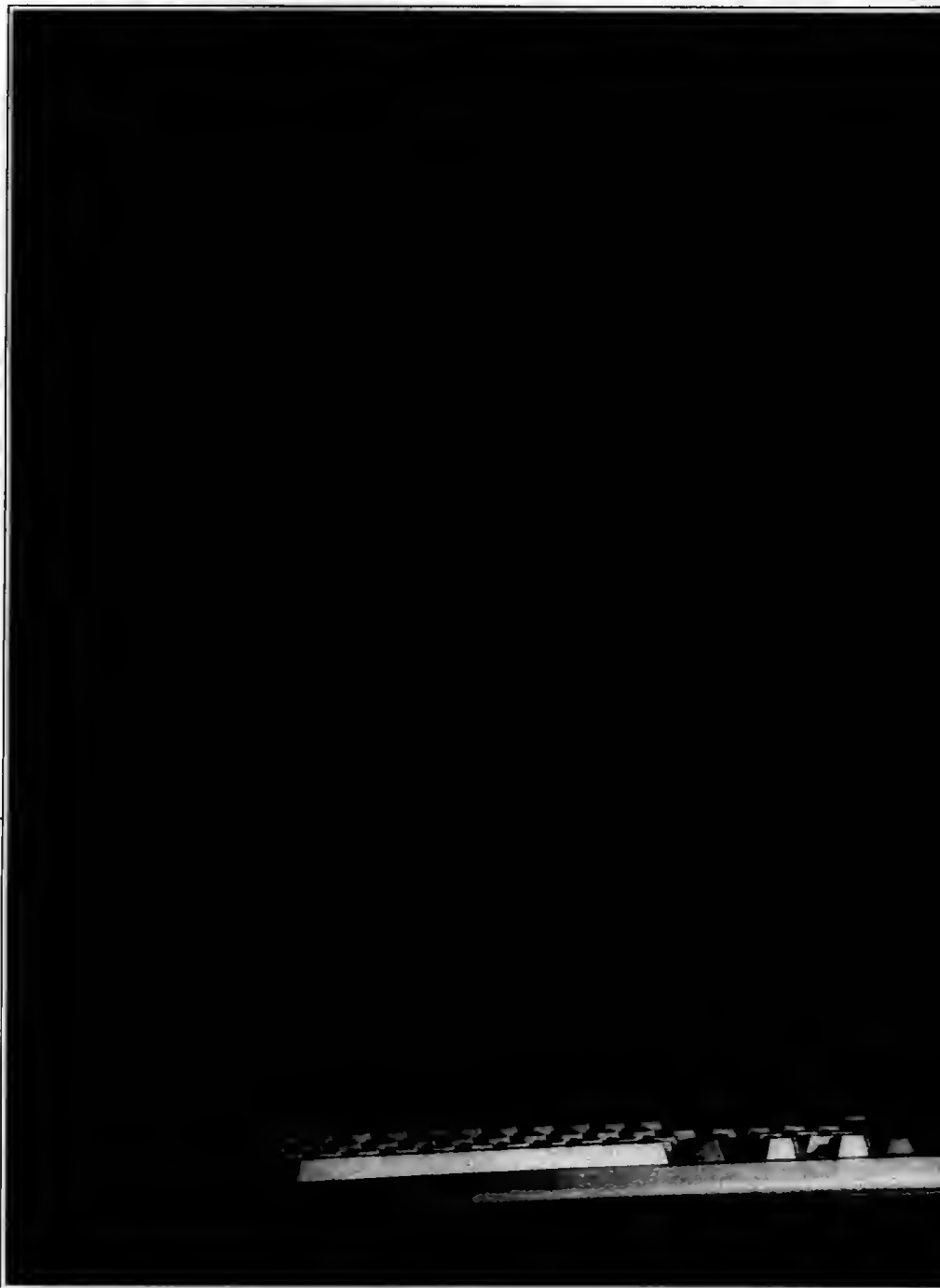
Our "**TAPE CONNECTION**" system can read and write 1/2" 9-Track 800/1600/6250 mainframe tapes.

Our "**SCANNING CONNECTION**" system can recognize text and scan pictures for desktop publishing

Our "**DISKETTE CONNECTION**" system can read and write files on your 3½ /5¼ /8" diskettes.

We manufacture many hardware products and have developed hundreds of programs. For product information call **602-779-3341.**

Flagstaff Engineering
1120 Kaibab • Flagstaff, AZ 86001



Management

FROM PAGE 57

attendees of the Computer Security Institute Conference in Atlanta last November.

Approximately 560 managers completed a three-page questionnaire on data security issues, Fisher says. Roughly three-quarters of the respondents are from the industry.

The balance of those who responded are from the government.

Fisher says the survey has a 95% confidence level, based on a total of 4,500 computer security professionals or 1,200 convention attendees.

Protecting data from the competition — be it in industry or government — is a top concern of those polled. Historically, organizations have felt they need to protect their data from their own employees.

Employee security is still a close second for both government and industry, however.

"Hackers are perceived more as a nuisance or embarrassment, not as a serious problem to be concerned with," Fisher comments.

Data classification and network security are listed as top security issues, according to the survey.

Tightening up

As data processing environments become more complex, end-user authentication is becoming a focus of security efforts, Ernst & Whinney officials point out.

While passwords and controlled-access systems have been the major means of securing data processing systems and computer rooms, such measures have not successfully prevented unauthorized access.

Ernst & Whinney anticipates the use of see-through tokens that authenticate a user's identification regardless of the trustworthiness of the user, location or network configuration. Smart cards and, to a lesser degree, biometric devices that read finger, voice and retinal prints are also expected to play a larger role in data security in the future.

Weak measure

Apparently, National Security Decision Directive 145 (NSDD-145), which placed the National Security Agency and the National Security Center in advisory roles on data security issues for business and industry, is having little effect on the public sector.

> **PROTECTING** data from the competition — be it in industry or government — is a top concern of those polled.

Only 6% of nongovernment organizations say the 3-year-old directive affects their security activities, while 24% of the government respondents say they are affected.

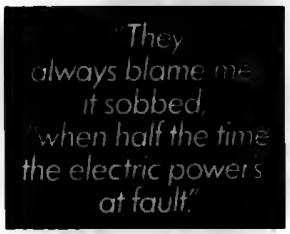
Wilson says the reason NSDD-145 is having little effect on the public sector is that many government data security measures are not applicable to the industry's data processing and storage concerns.

The government's special requirements for data integrity, however, will begin to rub off on commerce, Ernst & Whinney officials predict.

The government's use of encryption techniques to store data will soon make their way into the commercial sector.

Currently, the banking industry is the most prevalent nongovernment user of encryption. The industry uses encryption to provide message confidentiality and integrity for funds-transfer applications.

CONFESSIONS OF A DOWNED COMPUTER.



"All that raw electric power does funny things to my system."

The slightest dip or surge in electricity can play havoc with me. Even a few millisecond power disturbance can cause me to forget important data, give out misinformation, or cause damage to my hardware.

And, these disturbances are not just an occasional thing. Surveys done by AT&T Bell Laboratories and I.B.M. show they occur on the average of 135 times a year and can account for as much as 50% of all computer down time. That's why I need AT&T Power Protection Systems.

"I need the AT&T Power Protection Systems to turn my downtime into up time."

These AT&T Power units take raw, unpredictable commercial electric power, clean it, and distribute it to my system as pure regulated power. (Ahhhhhhhh.) And they support the widest variety of computers and communication equipment. The products include the AT&T Uninterruptible Power System (UPS), which has a built-in battery reserve to protect against all power fluctuations, as well as blackouts. Or, when a power reserve isn't necessary, there's the AT&T Power Line Conditioner (PLC), which eliminates 76% of all power disturbances.

"AT&T, you're the only one for me."

AT&T is the only company that designs, manufactures and services power protection equipment and also makes computers. So they understand me better. They know my problems and the right way to solve them. In fact, the architecture for their Uninterruptible Power Systems is patented. It includes fewer components for greater reliability and efficiency. So, do your computer a favor. Don't wait for it to act funny before you act. Find out more about the AT&T Power Protection Systems. Call 1-800-372-2447, or send the coupon to: AT&T Power Protection Systems, Attn: K.K. Ketterer, 961 Marcon Blvd., Dept. 203130, Allentown, PA 18103.

© 1987 AT&T

AT&T Power Protection Systems
Attn: K.K. Ketterer,
961 Marcon Blvd.,
Dept. 203130, Allentown, PA 18103.

Please send me the following:
- ☐ UPS Literature
- ☐ PLC Literature
- ☐ VAR Program Information
- ☐ Distributor Program Information
- ☐ Please have a sales representative contact me.

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip _____
Phone _____

AT&T
The right choice.

Data Model

PC-based Tools
- Entity-Relationship Diagrams
- Normalization of Relations
- Data Base Schema Generation

Consulting & Training
Chen & Associates
4884 Constitution
Suite 1E
Baton Rouge, LA 70808
(504) 388-2482

CRAY COMPATIBILITY.



PERIOD.

Whenever scientists or engineers talk supercomputing, the word "CRAY" surfaces almost immediately.

And with good reason. CRAY supercomputers represent a performance standard that has led the industry for over a decade. However, the power of supercomputing comes with a price tag not everyone can afford.

So a lot of people have been offering more affordable products, like "near supercomputers" with "CRAY-like performance."

But no one offered true CRAY-compatibility. Until now. The SCS-40 from Scientific Computer Systems is a 64-bit general-purpose computer that runs the same software as the CRAY X-MP® supercomputers.

How? Through an architecture designed specifically to execute the CRAY instruction set. Which means you can immediately run a vast array of application packages developed and optimized over ten years for use on CRAY computers.

And if you're ultimately in the market for a CRAY supercomputer, the SCS-40 is the perfect stepping stone. Every bit of experience gained on the SCS-40 is directly applicable to the CRAY environment.

The SCS-40 runs at over 25% the speed of an X-MP/14 computer. 50-300% faster than competing "near-supercomputers," as demonstrated by numerous real benchmarks. That's fast enough to take on such compute-intensive applications as finite element analysis and fluid flow dynamics.

Cost? Less than 10% that of the CRAY X-MP/14 system. So you can start supercomputing right now.

Plus, you can enjoy the price/performance of the SCS-40 without leaving the comfort of your VAX™-based VMS™ environment.

And the SCS-40's CRAY compatibility and performance have been proven through over 1000 hours of CPU time by scientists at the San Diego Supercomputer Center.

So if you want true CRAY supercomputer compatibility, you want the SCS-40. Period. Contact us for more information.

SCS
Scientific Computer Systems Corporation

10180 Barnes Canyon Road
San Diego, California 92121
(619) 546-1212

The Super Compatible.

CRAY X-MP is a registered trademark of Cray Research, Inc. VAX and VMS are trademarks of Digital Equipment Corp.

MIS insiders

CONTINUED FROM PAGE 57

same legal penalties as lawbreakers in any other line of work. But once they pay their fines and complete their jail terms, they can usually return to the DP fold either by finding a comparable job at another workplace or by setting themselves up as independent contractors or consultants.

To be sure, a certain percentage of corporate MIS organizations balk at the idea of hiring or retaining convicted felons. But if the wrongdoers persevere, they can usually re-establish themselves in the end.

Is the systems field overly lenient in its treatment of the former miscreants in its ranks? Should computing technicians and managers require themselves to heed the same ethical standards as doctors or lawyers and provide the MIS equivalent of disbarment for practitioners who overstep the bounds of accepted conduct?

Or do DP employees who once violated their positions of trust deserve a second chance as long as they pay their debt to society and are genuinely repentant? Does the systems trade have a moral responsibility to forgive past misdeeds, however egregious?

Professional label

Clearly, such questions can be examined from many perspectives and defy easy answers. But eventually, systems people will need to confront the problem of professional ethics face to face. Until they do so, they will never be fully justified in labeling themselves professionals.

What prompted the present meditation on information systems ethics was a story that appeared in *Computerworld* two weeks ago. The story concerns Stan Rifkin, who in the early 1980s held MIS management positions with the American Red Cross and the American Association for the Advancement of Science. Last spring, Rifkin was elected a director of the Washington, D.C., section of the Institute of Electrical and Electronics Engineers, Inc.

But, as the story makes clear, his personal history also includes a highly dubious claim to fame. In 1979, Rifkin began a three-year prison stretch after being convicted of electronically stealing $10.2 million from Security Pacific National Bank, where he formerly worked as a systems consultant.

By itself, the mere fact that a felon is now occupying a position of some authority within a major professional association may be of little consequence.

What makes the story noteworthy, however, is the additional disclosure that, although the section's leaders knew of Rifkin's background, they failed to tell their constituents, some of whom consider the omission presumptuous.

At the story's heart, therefore, lies the question of whether association members have the right to know for whom they are voting, especially when a candidate has been convicted of a felony that relates directly to his occupation.

But the story raises another question with even broader implications: Should a systems specialist continue to enjoy the privileges of working in his field when he has abused his position of trust?

Most of the people who agreed to be interviewed for the story take a comparatively charitable position on the subject. Why, they ask, should an ex-con who makes no secret of his criminal past endure a lifetime of punishment for one regrettable misdeed that may have occurred many years earlier?

Those who advance the let-bygones-be-bygones argument present their case forcefully and make some valid points. But so does the hard-line minority that espouses exactly the opposite viewpoint and wants systems employees held to the same ethical standards and sanctions as physicians and attorneys.

Maybe, the minority line of reasoning goes, potential wrongdoers would be dissuaded from committing premeditated crimes if they understood at the outset that misbehavior could cost them their careers.

As to the question of whether one or the other side of the argument is right, no one can say with certainty. At least one point, however, is beyond dispute: How the systems field ultimately responds to the dilemma of unethical conduct by its practitioners will go a long way toward determining whether the field will ever meet the minimum requirements of a true profession.

Many systems specialists like to think of their discipline as a profession on a par with medicine, law and accounting. But the sad truth of the matter is that MIS has yet to make the grade as a profession in the strict sense of the term.

Just as a tropical storm must reach a specified level of intensity before it can be classified as a hurricane, so a highly skilled occupation must satisfy certain well-defined criteria before it can qualify as a profession. Included among the prerequisites of an authentic profession is a recognized code of ethics, which computing currently lacks.

Someday, information systems may mature to the point at which the field certifies all its members as competent practitioners, formulates its own version of the Hippocratic oath and enforces high ethical standards through stiff penalties. For now, though, DP employees will have to be content to accept their specialty for what it truly is — a potential profession that has yet to come of age.

Beeler is a *Computerworld* West Coast correspondent.

COMDEX/Spring '87
GETS YOU GROWING.



Go to COMDEX/Spring '87 and gear your business up for extra profits and growth. Because there you'll gather all the resources you need to make the most of the busiest selling season of the year.

Exhibits to grow on

COMDEX/Spring '87 unites you with the hottest selling products and services including hardware and software to automate and integrate offices. New tools and techniques for communications and networking. Advances in micro-to-mainframe links. Mass storage devices such as CD ROM. CAD/CAM and desktop publishing products. All the products and services to grow on.

Insight to grow on

With a Conference that includes the acclaimed Desktop Publishing and CAD/CAM Seminars, and special sessions on microcommunications and software challenges, COMDEX/Spring '87 shows you the workings of today's money machines.

Thousands of resellers from all over the country are gearing up for growth at COMDEX/Spring '87. Get your business growing by completing and sending in the coupon for attendee information.

Produced by The Interface Group, Inc., 300 First Avenue, Needham, MA 02194.

COMDEX/Spring '87
June 1–4, 1987
Georgia World Congress Center
Atlanta, Georgia
It's time to get up and grow.

I want to get up and grow at COMDEX/Spring '87!

☐ Send me complete attendee information
☐ Send me exhibitor information.

Name_____
Title_____
Company_____
Address_____
City_____ State_____ Zip_____
Phone ( ) _____

Return to: The Interface Group, Inc.
300 First Avenue
Needham, MA 02194-2720
CPW-3-2-87

The Interface Group, Inc



The Only Comparison More Important Than His Is Yours.

Here's your chance to find out why Dr. Edgar F. Codd, the originator of the relational model, found SUPRA™ from Cincom® superior to IBM's DB2.

The seminar series, "The Business Value Of Relational Technology," offers you a comparative look at SUPRA and DB2. You'll see how relational database technology can substantially reduce costs of development and maintenance, plus you'll learn the importance of the "three integrities" (referential, entity and user-defined) to relational implementation.

Sharon B. Weinberg, President of Codd & Date Consulting Group and a former relational database consultant with IBM® responsible for releases of DB2, will review Dr. Codd's point-by-point comparison of SUPRA Release 1.3 and Release 2 of DB2. She'll demonstrate why Dr. Codd concluded that SUPRA adheres to 10 of his 12 basic rules for the relational model, versus DB2's 7 of 12, and explain why he stated, "SUPRA's rating is the highest achieved of all those I have reviewed to date."

A Comparative Seminar Of SUPRA And DB2.

3/23 Chicago	4/7 Toronto
3/26 Philadelphia	4/9 Montreal
3/27 New York	4/16 Atlanta
3/30 Dallas	4/21 San Francisco



CINCOM®

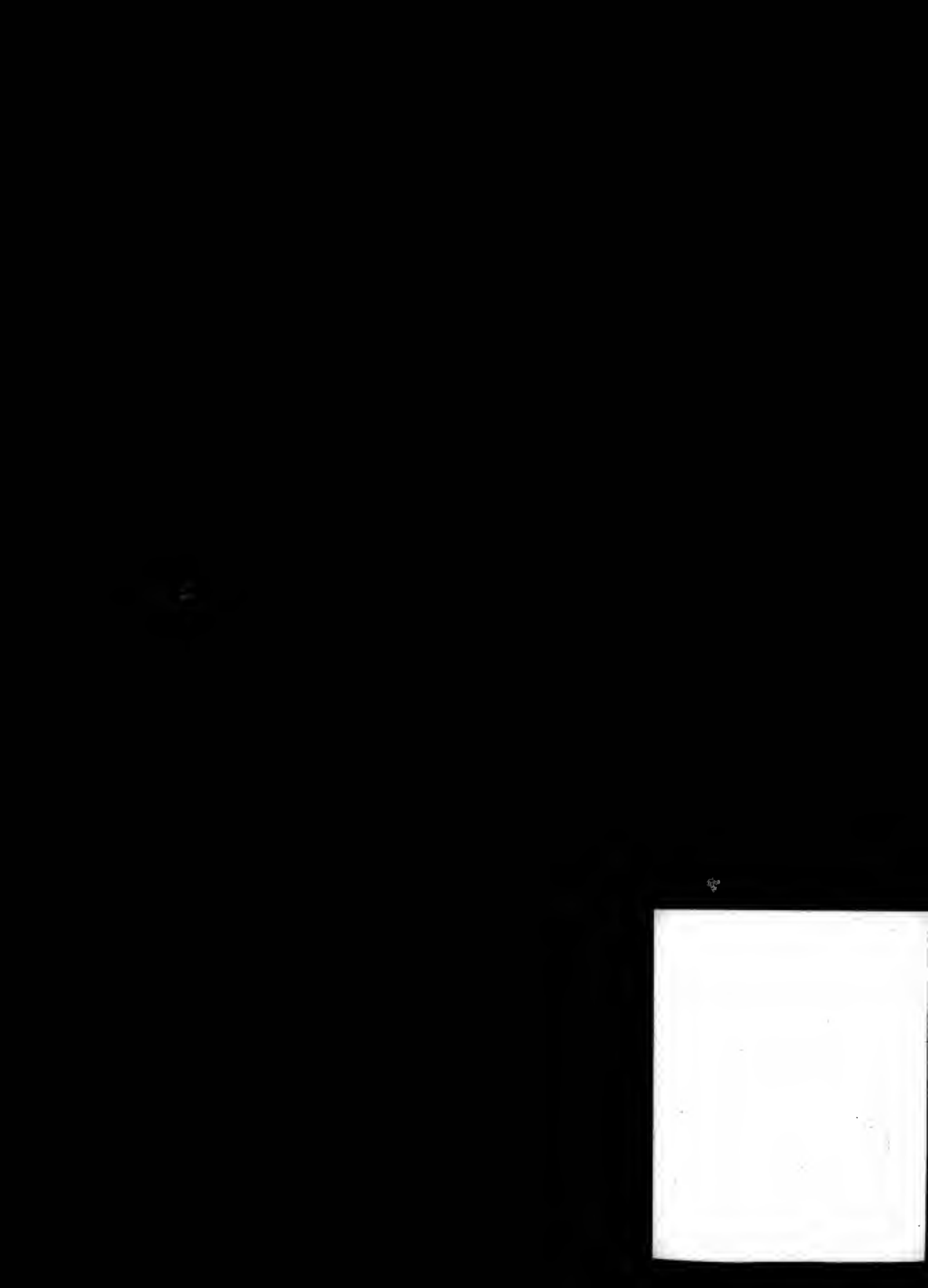
Advance registration is requested for the half-day seminars. To register or get more information, call Cincom today. Or, write Marketing Services Department, Cincom World Headquarters, 2300 Montana Avenue, Cincinnati, Ohio 45211.

1-800-543-3010

In Ohio, 1-513-661-6000
In Canada, 1-800-387-5914

IBM is a registered trademark of International Business Machines Corporation.





Irish

FROM PAGE 57

Later this year, The Travelers will open a facility in Limerick, Ireland, for design, development and testing of its application software that is online with facilities in Hartford, Conn., and Atlanta.

The chief advantage of the Irish site is the work force, which is less expensive than in the U.S., well-educated and loyal, according to Bill Gollnic, assistant director of data processing for The Travelers and project manager for the facility.

"The labor rate is the critical factor," Gollnic said. While the annual turnover rate of software professionals in the U.S. is estimated at about 12%, the rate in Ireland, where many workers have emigrated recently due to a lack of job opportunities, is about 2% to 3%, he said.

"Ireland produces high-quality computer science graduates, pretty much comparable to what we find in the U.S.," Gollnic noted. Language is also an issue, he added. "English-speaking people are easier to deal with in technical subjects."

The Travelers did not investigate other overseas locations for the site, Gollnic said. He declined to specify the total cost of locating the facility in Ireland compared with the U.S., but called it "considerably less."

American Airlines has looked into locating an on-line software development facility in Ireland and liked what it found, particularly in salary levels and government subsidies, as well as in the quality of work, American spokesman Joe Stroop said.

However, the airline is not currently planning to build an offshore software facility, Stroop said. It also examined a location in India and may investigate other sites, he added. He declined to compare Irish and Indian locations.

Last July, Geisco, the division of General Electric Co. that provides network-based services such as remote processing and electronic data interchange, opened a software development facility in Dublin.

The location was chosen for its proximity to a large processing center in Amsterdam, to which it is linked, and compared favorably with Scotland for availability and cost of workers, according to Brian Flanagan, Geisco's manager of finance for technology operations.

The IDA has attracted development of software facilities by a raft of U.S. computer and software vendors, including IBM, Digital Equipment Corp., Wang Laboratories, Inc. and Lotus Development Corp.

This has helped Ireland develop expertise in software work, so programmers and analysts "come a little bit cheaper" than they might otherwise, O'Brien said.

There are about 3,000 people working in software development in Irleand, O'Brien said. "A lot of people have trouble getting enough programmers and analysts. We have a surplus," he said.

He estimated the cost of hiring software professionals in Ireland is about 60% of doing so in Massachusetts and, with lower rent and other factors, the overall cost of operating a software facility in Ireland is about half that in the U.S.

The time difference between Ireland and the U.S., particularly the western areas, allows Irish facilities to access computers in the U.S. during less busy nighttime hours, O'Brien noted.

Limerick, the site of many of the offshore computer facilities, is near western Irleand's international air terminal, Shannon Airport, and the National Institute for Higher Education, a technologically oriented school modeled after MIT.

Ireland has difficulty competing for data-entry work and other low-skill functions with areas where labor is less expensive, such as the Caribbean and China, O'Brien noted. "Our advantage is that we can do quite sophisticated projects," he said.

CALENDAR

MARCH 8-14

Cullinet Applications and End-User Computing Conference. Dallas, March 8-10 — Contact: Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, Ma. 02090.

Spring 1987 Conference of the North American Honeywell Users Association. Charleston, S.C., March 8-13 — Contact: Lester T. Pacca, NAHU, Inc., P.O. Box 2037, Willingboro, N.J. 08046.

Automated Manufacturing: Computers, Communications and Controls in the Factory. St. Petersburg Beach, Fla., March 9-10 — Contact: Yvonne Chism, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

CAD/CAM/CAE Executive Workshops '87. Cambridge, Mass., March 9-10 — Contact: Cynthia Wolfram, Daratech, Inc., 16 Myrtle Ave., Cambridge, Mass. 02138.

Electronic Banking: The Challenges of Tomorrow's Bank Within Yesterday's Legal Framework. Brussels, March 9-10 — Contact: Alan Galaski, Conference Office Brussels, 19 rue de l'Orme, B-1040 Brussels.

11th Annual BRS User Meeting. Kansas City, Mo., March 9-10 — Contact: BRS Information Technologies, 1200 Route 7, Latham, N.Y. 12110.

Computer Technology and the Law: Protecting Your Rights. Arlington, Va., March 9-11 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Federal Office Systems Expo. Washington, D.C., March 9-12 — Contact: National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

Effective Management Skills for the MIS Manager. Cambridge, Mass., March 9-12 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Open Network Architecture: Computer III Status Report. Arlington, Va., March 10-11 — Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

Corpcon. New York, March 10-12 — Contact: Corpcon, P.O. Box 3727, Santa Monica, Calif. 90403. Also being held April 28-30 in Chicago and Sept. 21-23 in Los Angeles.

Optical Information Systems. Long Beach, Calif., March 11-13 — Contact: Meckler Publishing, 11 Ferry Lane W., Westport, Conn. 06880.

MARCH 15-21

The 1987 National Automated Clearing House Association Conference. San Diego, March 15-18 — Contact: Barbara Hill, Manager of Meeting Services, NACHA, Suite 640, 1901 L St. N.W., Washington, D.C. 20036.

Fifth Annual Computer Based Training Conference and Exposition. Atlanta, March 15-18 — Contact: Julia Stasio, Conference Registrar, Weingarten Publications, 38 Chauncy St., Boston, Mass. 02111.

Guide International. Anaheim, Calif., March 15-20 — Contact: Guide Headquarters, 111 E. Wacker Drive, Chicago, Ill. 60601.

1987 West Coast Manufacturing, Accounting and Production Information Control System Users Conference. San Diego, March 16-17 — Contact: Salem Corp., 1654 Poplar Lane, Annapolis, Md. 21401.

Artificial Intelligence and Expert Systems. Cleveland, March 16-17 — Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held in Louisville, Ky., Dayton, Ohio, Portland, Ore., Fort Worth, Texas, Baltimore, Richmond, Va., Concord, Calif., and Tulsa, Okla.

Fifth National Conference on Measuring Data Processing Quality and Productivity. Orlando, Fla., March 16-18 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

Electronic Data Processing Audit Managers' Roundup III. Orlando, Fla., March 16-19 — Contact: MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

Tutorial Week. Kissimmee, Fla., March 16-20 — Contact: Computer Society of IEEE, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Workshop on Factory Communications. Gaithersburg, Md., March 17-18 — Contact: Robert Rosenthal, B217 Technology Building, National Bureau of Standards, Gaithersburg, Md. 20899.

For sale or lease: 4381s and 3083s. Compare our rates. Call now. 1-800-528-0358, ext. 8806. Ask for Kelli.



Bell Atlantic™ Systems Leasing INTERNATIONAL

Sales Offices in: Atlanta, Austin, Boston, Chicago
Dallas, Houston, Los Angeles, New York, Philadelphia, Phoenix, Pittsburgh, San Francisco
Formerly Greyhound Capital Corporation

Power has never looked this good.

The WYSEpc 286.

Now you can get higher speed and higher resolution, together in extremely high style.

The WYSEpc 286 goes from "normal" speed to full 10 MHz throttle – *25% faster than a Personal Computer AT*–with the touch of a switch. A new lineup of graphics monitors lets you choose exactly the display capability you need.

Combine the WYSEpc 286 with the WY-530 monochrome or WY-630 color monitor and get outstanding performance. For enhanced color graphics, move up to the WY-640 EGA monitor. Or, bring CAD and desktop publishing applications into better focus, price-Wyse and pixel-Wyse, with the new WY-700 high resolution graphics display as shown at left.

With the new WYSEpc 286, you can also choose the keyboard that's the best fit: either the standard AT-style, or the IBM Enhanced PC keyboard. And you get the complete compatibility you should expect in every other way, including more than 350 tested off-the-shelf software packages.

Up to 80 Mb of disk storage and eight expansion slots give you everything you need for the most demanding single-user applications, or to anchor the most effective, economical multi-user systems.

And behind this incredible display of power and versatility is a company that ships more terminals than anybody but IBM.*

Write Wyse Technology, Attn: Marcom Dept. 286, 3571 N. First Street, San Jose, CA 95134. Or call toll-free, today, for more information.

Call 1-800-GET-WYSE

WYSE

YOU NEVER REGRET A WYSE DECISION.



*WYSE is a registered trademark of Wyse Technology. WYSEpc 286, WY-640, WY-530, WY-630, WY 700 and the "Y" shaped design are trademarks of Wyse Technology. IBM and Personal Computer AT are trademarks of International Business Machines Corporation. © 1986 Wyse Technology. *Dataquest 1985 terminal shipment update*

COMPUTER INDUSTRY

INDUSTRY INSIGHT



Clinton Wilder

The year of the lawyer

A recent record album by folk singer Tom Paxton carried the title "One Million Lawyers — and Other Disasters." After the first two months of 1987, that sentiment could certainly apply to the computer industry. Instead of the Year of the LAN (about the fifth in a row, at last count), 1987 is the Year of the Lawyer.

Not since IBM went toe-to-toe with the U.S. government's antitrust division has there been such a flurry of barrister-related headlines. Lotus Development Corp.'s patent case against Paperback Software International and Mosaic Software, Inc. certainly led the parade, but it was just the beginning.

Now we have Ashton-Tate vs. Migent, Inc. — and vice versa. Rodime PLC vs. the 3.5-in. disk drive industry. The modem industry vs. Hayes Microcomputer Products, Inc. Micro software vendors, large and small, launching anti-piracy campaigns in the U.S., Canada and elsewhere. Digital Equipment Corp. stepping up its legal efforts against any and all makers of DEC-compatible peripherals — or at least those that don't have joint marketing or licensing deals with DEC.

And which player in the telecommunications industry has received the most ink this year? The U.S. Justice Department.

In the case of micro software, all the legal wrangling is a sure sign that the industry is aging. (In this context, "maturing" is the wrong word, since it implies that the amount of squabbling should be decreasing, not increasing).

No matter what high-minded legal precepts they claim they are only trying to uphold, companies at the top of the heap in their markets are using every means possible, including the courts, to stay there.

But computer users should not expend all their grains of salt

Continued on page 71

Industry scoffs at 3½-in. disk suit

BY JAMES A. MARTIN
CW STAFF

LONGMONT, Colo. — Rodime PLC's recent patent infringement lawsuit against 3½-in. disk drive competitor Miniscribe Corp. has met with skepticism from analysts and insiders, one of whom says the suit "is like trying to enforce a patent on a yardstick."

The suit was filed in U.S. District Court in Colorado last October and amended Feb. 10. In the suit, Scotland-based Rodime claims it first developed the 3½-in. disk drive technology that is becoming increasingly popular with microcomputer vendors. Miniscribe, based in Longmont, Colo., was infringing that patent by marketing a 3½-in. disk drive product without a licensing agreement, the suit alleges.

"At present, there are some 19 U.S. companies either manufacturing or offering to sell micro hard disk drive systems, which we believe infringes [on] our patents," says Bill Batchelor, Rodime's finance director.

Since April 1986, Rodime attorneys have been inviting 3½-in. disk drive manufacturers "either to obtain licenses from Rodime or to desist from any further infringing activities," according to Batchelor.

Analysts and observers have scoffed at Rodime's action, saying it will not hold water under close scrutiny.

"It's a very broad patent, and this sort of litigation comes up frequently, with few favorable decisions," says Andrew Neff, a technology analyst with Montgomery Securities in San Francisco.

Neff suggests that Rodime is motivated more by market concerns than legal principles. "A year ago, Rodime was the large-

Continued on page 71

Paperback wants Lotus case dismissed

Claims users not named in move seen as deadline-beater

BY PEGGY WATT
CW STAFF

BERKELEY, Calif. — Paperback Software International has asked a federal district court to dismiss Lotus Development Corp.'s claims of copyright infringement, saying the vital party — software owners — were not named in the proceedings.

The reply may not end the case, but it meets Paperback Software's legal deadline for responding to the suit filed by Lotus in Boston [CW, Jan. 19], according to Adam Osborne, Paperback Software president.

Osborne said his attorneys advised that the customers' role should be defined in the case.

Paperback Software sells VP Planner, marketed as an enhanced clone of 1-2-3. Lotus also sued Mosaic Software, Inc., which will handle its defense separately.

Osborne also said his company's insurance agent, Atlantic Mutual Insurance Co., has taken responsibility for the litigation and will handle the defense. The case has drawn interest throughout the user community and among attorneys interested in computer law.



Adam Osborne

The Lawyers' Special Interest Group on The Source has already launched an ongoing, online conference about the issue, according to Paul Bernstein, president of the Lawyers' Microcomputer Users Group (Lawmug) in Chicago.

"The initial reaction from Lawmug members is support for the defendants," Bernstein said. Lawmug and other groups of computer law scholars have indicated interest in filing amicus briefs, or third-party opinions, in the case.

Osborne said a countersuit is

Continued on page 74

Telebit to cancel DCA mart pact

BY ELISABETH HORWITT
CW STAFF

CUPERTINO, Calif. — Telebit Corp. intends to break off its joint distribution and marketing agreement with Digital Communications Associates, Inc.'s (DCA) microcomputer products division, the company recently told *Computerworld*.

The projected move is part of Telebit's quest for new distribution channels that better support its new marketing strategy of selling dial-up communications systems rather than stand-alone modems, according to Telebit President and Chief Executive Officer James Jordan.

Formerly executive vice-president of local-area network vendor Ungermann-Bass, Inc., Jordan joined Telebit approximately six months ago.

DCA reserved comment on the proposed breakup since a "formalized agreement has not been reached," according to DCA Vice-President of Corporate Communications Robert Zack. Zack expressed surprise that Jordan had talked to *Com-*

Continued on page 74

Inside

- Porteus on CAD/CAM/CAE stock opportunities. Page 70.
- Japan asks its semiconductor industry to cut production by 10%. Page 74.

Matsushita, IBM settle BIOS copyright infringement dispute

BY YASUKO YOSHIMI
SPECIAL TO CW

OSAKA, Japan — Matsushita Electric Industrial Co. last week admitted that its Panasonic microcomputers have violated IBM's copyright on the BIOS chip used in the IBM Personal Computer AT.

Matsushita's Shigeru Hayakawa announced that a friendly compromise had been reached between the two firms under which Matsushita agreed to pay IBM $1.95 million. Matsushita agreed to recall to Japan its exported inventory of approximately 2,000 units of the AT-compatible FX-800, sold in the U.S. as the Panasonic Industrial Co. Business Partner 286.

Jim Cullen, national marketing manager for computer products for Secaucus, N.J.-based Panasonic, said the agreement will not affect about 2,000 FX-800s already sold into dealer and distributor channels. There will be a 90-day suspension in future sales of the Intel Corp. 80286-based product while Matsushita rewrites the BIOS to comply with the copyright settlement, Cullen said.

"Matsushita certainly has the engineering horsepower" to complete the rewrite in 90 days, Cullen added. He said Panasonic plans to reintroduce the Business Partner 286 at Comdex/Spring '87.

Matsushita last summer started full-scale shipments of the FX-800 models in an attempt to crack the U.S. and European personal computer markets. Cullen said the AT compatible accounts for about 20% of the sales of Panasonic's computer product line, which also includes the PC-compatible Business Partner, or FX-600, and a portable.

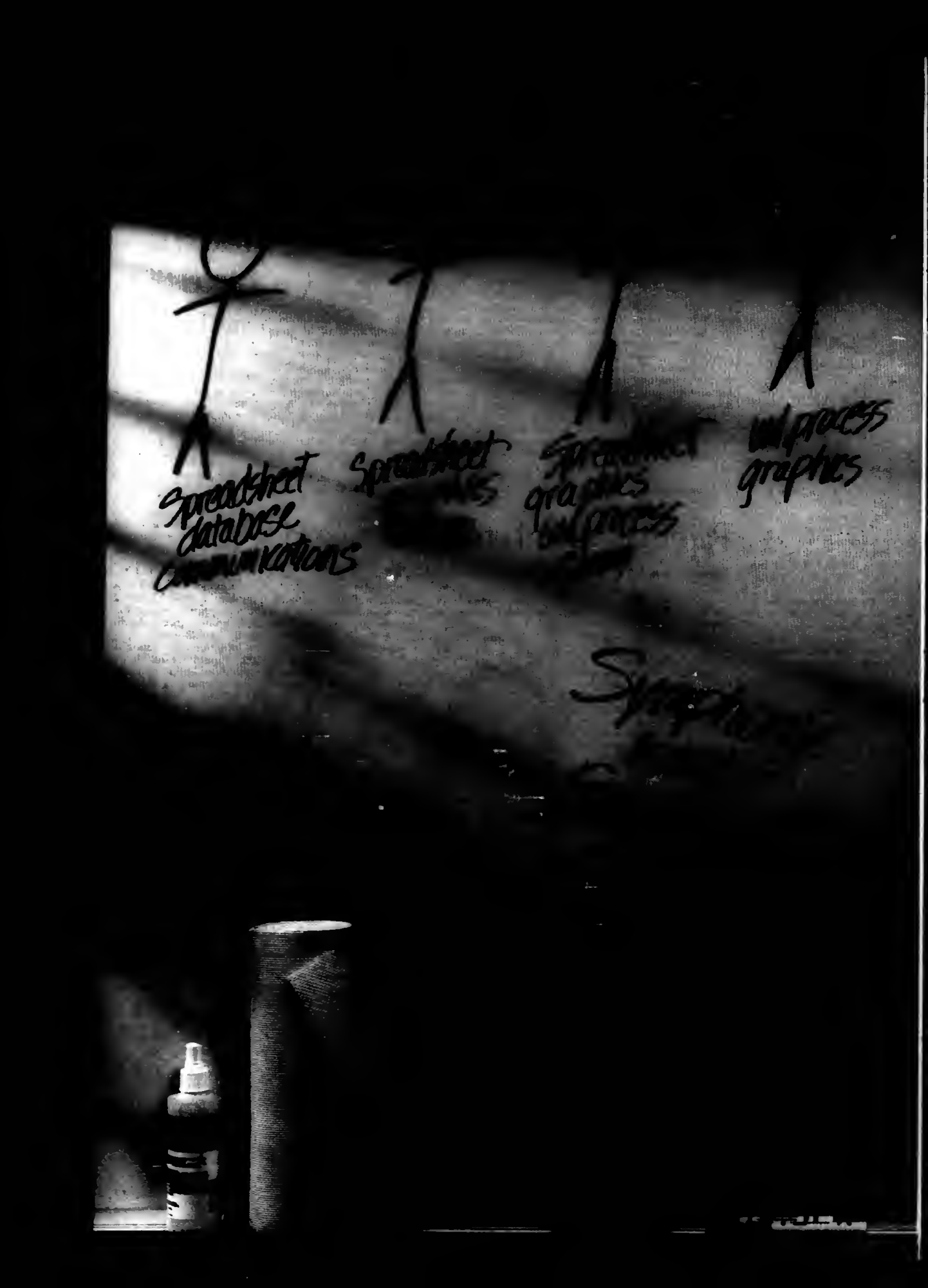
IBM had requested in January that Matsushita halt FX-800 shipments after customs inspections in Seattle revealed the IBM BIOS copyright infringement.

Matsushita Electric, according to industry sources, was anxious to conclude the copyright dispute amicably because of its OEM relationship with IBM Japan for the IBM 5550 systems line.

Both Hayakawa and Cullen warned separately that other Japanese manufacturers of IBM-compatible personal computers may come under fire at any moment, as IBM is tightening its software screws. "IBM is not being shy about this — it is taking a very hard line," Cullen said. "That is certainly an indication to others."

Computerworld *senior editor Clinton Wilder contributed to this story.*

Yoshimi is a Tokyo-based correspondent for the Asian bureau of the CW Communications International News Service.


spreadsheet
database
graphics
wordprocess
graphics



Symphony® is the one software product no business and no business person can afford to be without.

Based on the 1-2-3® spreadsheet technology, Symphony pulls together five key functions in one program. Functions that help a marketing manager work smarter. Give a financial analyst a clearer picture. Run an entire company more effectively.

An all-in-one investment, Symphony increases in value over time. It offers continuous growth through Lotus® Add-in products like Spelling Checker, Text Outliner, Symphony Link™ and through more than 250 specialized applications designed by independent software developers.

What's more, Lotus backs Symphony with a free telephone hotline and Lotus PROMPT,™ a new comprehensive user support program.

One product to train on. One company to support you. One investment that grows over time. For all these reasons, you should consider standardizing on Symphony to meet the personal computing needs of your corporation.

Lotus Symphony

A complete general-purpose software tool built around the world's leading spreadsheet technology.

© 1987 Lotus Development Corporation. Lotus, 1-2-3 and Symphony are registered trademarks of Lotus Development Corporation.
Symphony Link and Lotus PROMPT are trademarks of Lotus Development Corporation.

ACTIVE ISSUES



Kathy Porteus

CAD/CAM/CAE stocks on the rise

When expectations for improved business conditions are added to a record breaking stock market, the result is sensational stock performances by computer-aided design, manufacturing and engineering (CAD/CAM/CAE) companies.

Since the beginning of this year, stock prices of CAD/CAM/CAE companies such as Autodesk, Inc. (ACAD — 62), Mentor Graphics Corp. (MENT — 28½), Computervision Corp. (CVN — 21¼), Intergraph Corp. (INGR — 24¼) and PDA Engineering (PDAS — 12) have soared between 30% and 55%.

"There's no question that some substantial anticipation of fundamentals is propelling this group of stocks," says Peter Heymann, analyst with Drexel Burnham Lambert, Inc. "Investors interpret faint signs of a rebound in semiconductor demand as something that will eventually translate into an improved spending environment for CAD/CAM/CAE tools."

According to Heymann, CAD/CAM/CAE stocks have also attracted attention because many still trade at the low end of their historical price ranges at a time when investors are hungry for undervalued situations. Nevertheless, Heymann says he sees no bargains in the group.

Laura Conigliaro, analyst with Prudential-Bache Securities, Inc., agrees that this year's outlook for CAD/CAM business is "certainly not explosive." However, she says, this year "represents the end of a very painful industry transition from host-based to distributed CAD/CAM/CAE systems." According to Conigliaro, companies that have seen the worst are now in a turnaround mode, thus justifiably attracting Wall Street's notice.

Topping Conigliaro's list of recommendations are Mentor Graphics and Autodesk. She estimates Mentor Graphics, a leading CAE vendor, will earn $1.05 per share this year, compared with earnings of 67 cents per share in fiscal 1986, ended Dec. 31.

Autodesk, the leading supplier of CAD/CAM software for personal computer-based systems, should continue to perform well, according to Conigliaro. Because of the company's strong fiscal 1987 results, she is currently reviewing her estimate of $2.05 per share and will probably raise it for Autodesk's fiscal 1988, ending Jan. 31.

Conigliaro also recommends Intergraph, the leading independent CAD/CAM hardware vendor, and PDA Engineering, a supplier of mechanical engineering software that enables modeling of complex shapes. "These stocks come with different risks but still represent good opportunities," she says.

Peter Schleider of L. F. Rothschild, Unterberg Towbin recommends purchase of Autodesk and PDA Engineering because as pure software companies, he says they "offer the best play in the CAD/CAM/CAE industry."

According to Schleider, both companies have already priced their products for the volume marketplace and each supports a number of different hardware systems.

On the other hand, Schleider recently downgraded his recommendations of Valid Logic Systems, Inc. and Computervision. He shifted his opinion on Valid Logic to "hold" owing to uncertainties created by the company's proposed merger with Telesis Systems, a vendor of CAD systems for printed-circuit design. Computervision now has a "hold" rating from Schleider to reflect the stock's substantial move and his earnings estimate of 50 to 60 cents per share for Computervision's fiscal 1987, ending Dec. 31.

According to Schleider, investors should be aware of two new developments affecting the CAD/CAM/CAE arena. He foresees widespread customer confusion this year, owing to many hardware product announcements coming from a variety of suppliers.

He adds, "We are beginning to see the merging of engineering and commercial computer purchases, which means CAD/CAM vendors will need to change their sales and marketing strategy to focus more on MIS departments."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Series/1

- Custom Software & Systems
- RPS Specialists
- All types of communications Async • SNA • LU 6.2 • CM
- In-house Series 1 development laboratory

Applied Management, Inc.
1370 Piccard Drive, Suite 280
Rockville, Maryland 20850
301-670-4220

Year of lawyer

CONTINUED FROM PAGE 67

on the industry leaders/plaintiffs. One should not forget that the defendants, who love to cite David and Goliath, the death of industry innovation and all that, often reap a tidy windfall of publicity from such lawsuits. Paperback Software's Adam Osborne has admitted as much, noting a nice jump in the sales of VP Planner since Lotus went to court in January.

Also, remember that the defendants are in business to capitalize on the success of Lotus 1-2-3, or the micro data base market that Ashton-Tate created, or the heady demand for DEC systems and peripherals.

Whether that is patent infringement or simply astute development and marketing will be decided in the courts, but let's not forget that "innovation," in this context, often means how well a vendor emulates an industry standard.

What does it all mean for users? On the surface, perhaps very little. But if the micro software industry — or any other, for that matter — drastically shifts its attention and energies from the development lab to the courtroom, the customer will ultimately suffer.

Targeting user's needs

It does a user little good to listen to debates about "look and feel," obscure legal precedents or the differences between copyright law and patent law. One would much rather hear talk about better user interfaces, networking standards, productivity gains or site licensing.

Unfortunately for the above distinction, this year is not off to a good start. And litigation almost always tends to lead to more litigation, with countersuits, preliminary injunctions and (later) appeals multiplying like mosquitoes over a swamp in springtime.

That makes a good analogy for the lawyers swarming around the computer industry lately.

EVERYONE HAS HEARD of market research. Now there is market research of the market researchers.

New York-based Knowledge Engineering has compiled a report that reviews and rates the artificial intelligence market forecasts published by 10 market research firms in 1986. The firm's pitch is that for $47.50 plus shipping charges, the corporate user can get Knowledge Engineering's view of "3,000 pages and $25,000 worth" of AI research reports.

Interestingly, Knowledge Engineering found that various firms' forecasts of the AI market in 1990 ranged from $885 million to $4.2 billion — a difference of almost five to one.

Even allowing for the difficulty of defining the AI marketplace, that discrepancy truly gives one pause about the relative value of such forecasts.

Wilder is *Computerworld's* senior editor, computer industry.



Industry scoffs

CONTINUED FROM PAGE 67

est 3½-in. disk drive company, and now they're number two under Miniscribe," he says.

"So if you're going to hit someone, you're going to hit somebody that has hit you. Miniscribe is the only other significant player in the market."

"Rodime is claiming a patent on the size of a disk drive, and you just can't enforce a patent on a yardstick," says one observer, who asked not to be identified.

"The technology used in these drives is very similar to that used on 5¼-in. disk drives, and Rodime is trying to claim that what they have is unique," the observer continues.

If successful, the suit could force all 3½-in. disk drive firms to pay Rodime a 7% royalty fee for each drive sold. Rodime could stand to gain as much as $70 million annually from those fees, according to Allen E. Carrier, a U.S. spokesman for Rodime.

Could corner market

Rodime could gain control of the market if the suit is successful, Carrier says. He estimates the U.S. market for 3½-in. disk drive technology might reach $1 billion by next year.

Miniscribe was targeted in the suit because it is the largest supplier in that market and is IBM's biggest supplier for 3½-in. disk drives, according to Carrier.

Rodime is only seeking to protect its investments, he adds. "The company simply wants to get the rewards for the risks they took in developing this technology, and they are not looking to gain a monopoly," Carrier says.

There is no timetable for the litigation at this point, and observers say it could be two years before the suit is heard. In the meantime, the disk drive companies have until June 30 to respond to Rodime's request for licensing fees.

CHRIS GANE'S LATEST BOOK
Developing Business Systems in SQL
using ORACLE
on the IBM-PC
Send check for $45 per copy (plus $2 shipping in US, $4 non-US) or call 212/245-8870 to order with Amex card, or to get brochure
Rapid System Development
211 W. 56th Street, 36H7
New York NY 10019-4323

Turn batch COBOL programmers into on-line programmers in 1 day.

With COBOL/XE *all* your batch COBOL programmers can now develop CICS, CMS, and TSO applications...without tedious on-line coding and without learning complicated, new coding techniques. Put their skills to work now to help you cut your backlog of on-line applications...and do it faster and more efficiently than ever before.

Familiar, Natural Coding. COBOL/XE reduces training costs by extending the familiar set of batch COBOL commands to the on-line environment. Now, programmers can develop on-line programs simply and naturally, using easily learned extensions of ANSI COBOL.

Eliminate BMS Mapping. Using COBOL/XE's interactive screen PAINTing facility, anyone can quickly and easily design screen layouts on a 3270 or PC/370 screen without writing a single line of code. New screens can handle any attribute an application may require, completely eliminating the need for complex BMS code.

Portability of Code. On-line applications can be developed and tested with COBOL/XE in any environment and executed in any one of them without being changed or recompiled. Develop applications in one environment and execute them in another with no extra coding.

Reduce Debugging and Maintenance. The COBOL/XE debugger provides real-time tracing, testing, and verifying of a COBOL/XE program's logic, saving the time and expense of trial-and-error testing. By specifying various break conditions, you can dynamically control the execution of any COBOL/XE program.

Without COBOL/XE. *A pseudo-conversational task coded in Command-Level COBOL.*



With COBOL/XE. *A pseudo-conversational task coded in COBOL/XE. COBOL/XE automatically performs the functions necessary for pseudo-conversational CICS execution simply by using the verbs DISPLAY and ACCEPT. Complex CICS code is unnecessary, and efficient execution is ensured.*



Solid Support. Seventeen years in the software business gives our worldwide staff the expertise you need to optimize the effectiveness of your corporate computing resources. From installation, consulting and training to pre- and post-sales support, we're there to offer you our knowledge.

Free Trial. Turn batch COBOL programmers into on-line programmers in *one day* with COBOL/XE. Call or write to arrange for a free 30-day trial. On-Line Software International, Inc., Two Executive Drive, Fort Lee, NJ 07024. In Canada, call 201·592·0009.

800·642·0177

On-Line Software International
Authorities in IBM Software

COBOL/XE. *The On-line Applications Development System for the Batch Programmer.*

IBM is a registered trademark of International Business Machines



Yes! I want on-line productivity in my shop today.

Please send me more information on the following application development software products.

☐ UFO® Productivity System ☐ UFO®/IMS ☐ COBOL/XE

Or call us toll-free at 1-800-642-0177. In Canada, call 201-592-0009.

Name _____ Title _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

Mainframe _____ IBM PCs ☐ No ☐ Yes How many? _____

TP Monitor _____ Release _____

DBMS _____

Operating System: MVS _____ DOS/VSE _____ VM _____

Are you currently using any other On-Line Software International products? _____ No _____ Yes

OSP027
OF___ 397

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 897 FORT LEE, NJ 07024

POSTAGE WILL BE PAID BY ADDRESSEE

On-Line Software
International, Inc.
Fort Lee Executive Park
Two Executive Drive
Fort Lee, New Jersey 07024-9990



UFO® Crosses New Frontiers.

Now with Portability Between CICS, CMS and TSO!

UFO, the leading CICS application development tool, has now been substantially enhanced. Now—as the UFO Productivity System—it goes beyond the reach of other products ... all the way to a new standard in development speed and flexibility.

New environments: CMS and TSO. Now, you can have a common development system for *all* your environments—not only CICS, but CMS, TSO, VM ... even the upcoming 9370. So you can do your development work in an interactive environment, without the danger of overburdening your production systems.

Portability also means you can move applications from one environment to another without wasting precious time recoding. And, you get all this functionality with efficiency that's within 5% of command-level COBOL!

New data base access: SQL and DB2. With the new UFO Productivity System, you can *automatically* access your new SQL and DB2 data bases—in addition to DL/1 and VSAM. Along with the system's superb prototyping capabilities, this quick and easy file access makes developing and implementing applications faster than ever before.

New development options: a non-procedural menu-based development facility, and a state-of-the-art 4GL. Two development options let you balance programmer time while handling any application—from the simplest to the most complex. When speed is crucial, the menu-based facility lets you "code and go." For more complex applications, the 4GL gives you complete control over transaction logic.

Whichever approach you choose, you get the timesaving benefits of pre-programmed logic, built-in functions, and portability between environments.

New maintenance speed with our active data dictionary. Our active data dictionary, with automatic run-time linking of data definitions and programs, allows you to achieve data independence. To alter a screen layout or a data definition, you need only make the change once. And the change will *automatically and immediately* be carried throughout every program that's affected.

New productivity for your shop. For more information on how the UFO Productivity System can help you break through to a new world of productivity—or to arrange for a free 30-day trial—call us today. On-Line Software International, Inc., Two Executive Drive, Fort Lee, NJ 07024. In Canada, call 201·592·0009.

800·642·0177

On-Line Software International
Authorities in IBM® Software

UFO Productivity System. *Fast, Flexible On-line Applications Development.*

IBM is a registered trademark of International Business Machines

Japan asks chip makers to cut production

BY JAMES A. MARTIN
CW STAFF

Under fire from the U.S., Japan's Ministry of International Trade and Industry has asked that country's semiconductor industry to cut production by 10% during the next three years.

Japanese officials said reduced chip production would drive up prices and thus help curb predatory pricing, which the U.S. has accused Japanese suppliers of practicing in U.S. and overseas markets.

The U.S. and Japan signed a trade accord in July that, in theory, would open up the Japanese semiconductor market more to U.S suppliers and stop Japanese firms from selling mass quantities of dynamic random-access memory (RAM) chips in the U.S. at extremely low prices.

The Japanese government, however, has been criticized recently by U.S. vendors for not enforcing the trade accord.

The Semiconductor Industry Association (SIA) was cautious about Japan's call for a drop in chip production. In the past, the Japanese have not always lived up to their word, so a wait-and-see attitude is the only appropriate response, according to Daryl Hatano, SIA's director of international trade and government affairs.

Separately, Texas Instruments, Inc. settled another round of patent infringement lawsuits, this time with Japan's Mitsubishi Electric Corp., Oki Electric Industry Co. and Matsushita Electic Trading Co.

The three firms were among nine Pacific Rim semiconductor firms sued last year by TI for dynamic RAM patent infringement. The firms have agreed to make significant royalty payments and pay additional per-unit royalties to TI.

Telebit

FROM PAGE 67

puterworld about the matter as if it were a foregone conclusion.

Telebit recently entered an OEM agreement with DCA's Network Division, which sells a full line of modems and multiplexers as well as T1 switches from DCA subsidiary Cohesive Network Corp.

DCA/Telebit Data Systems, Telebit's 1½-year-old joint venture with DCA's micro division, has distributed approximately 5,000 of Telebit's 18K bit/sec. asynchronous dial-up modems, according to Jordan.

Although the venture successfully launched the product, Jordan said Telebit was not satisfied with the sales approach by dealers that handled DCA's microcomputer-based products, such as the Irma terminal-emulation board.

"They did not present modems as sophisticated solutions or understand communications software like Blast and Crosstalk," Jordan said.

Telebit plans to enhance its current modem product line with X.25 packet switching, Systems Network Architecture support, protocol conversion and, eventually, network management, Jordan stated. The resulting communications systems will target the dial-up communications market, which Telebit expects to remain healthy while the world waits for Integrated Services Digital Network (ISDN), Jordan said. "I don't think ISDN will be here tomorrow," he asserted.

Paperback

FROM PAGE 67

also a possibility. For now, however, he says Paperback Software is enjoying a boost in sales that he attributes to publicity about the suit.

Paperback Software and Mosaic Software are small companies and may have difficulty financing a legal defense. As a result, according to industry sources, the two firms will share some defense resources, even though they are being sued separately.

Mosaic has already established a legal defense fund designed to raise money for its defense.

'Overburdening' motive?

"One of Lotus's motives must be to overburden a company like Mosaic with financial expenditures," said Richard Dikran Bezjian, president of Mosaic. "For them [Lotus], a half a million dollars doesn't mean much. For us it could simply mean the livelihood of the company. That is why we put together the defense fund."

The Lotus suits have prompted industry speculation that Ashton-Tate may also legally challenge firms that have cloned its popular Dbase series data base software tool.

"We believe a company ought to be able to protect its proprietary technology," said Edward M. Esber Jr., chairman of Ashton-Tate, who declined to disclose his firm's plans.

"Cases like the Lotus case, should it go all the way to court, will clarify things or set precedents upon which other suits can be filed, if they are successful," Esber said. But if Ashton-Tate decides to file similiar suits, it will not necessarily wait for the Lotus suits to be resolved, Esber added. He also argued that a programming language developed and marketed by one company, such as the Dbase language, deserves more protection than languages such as Basic and Fortran.

Ashton-Tate recently sued smaller data base developer Migent, Inc., but the suit involves more traditional trade secret theft allegations, rather than software patent infringement. Ashton-Tate has charged former Ashton-Tate developers now working for Migent with using proprietary information in the development of future products. Migent, in turn, has sued Ashton-Tate for violation of antitrust laws.

Senior editor Douglas Barney contributed to this story.

REACH NEARLY 40,000 AUSTRALIAN COMPUTER PROFESSIONALS.



CW Communications covers the Australian computer market with four publications.

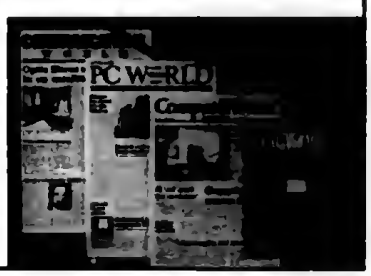
Each week, over 8,000 MIS/DP executives read *Computerworld Australia* for complete coverage of computer technology in medium-to-large organizations.

Australian PC World is Australia's biweekly newspaper dedicated to IBM-standard personal computing. 10,000 IBM PC owners and potential buyers receive *Australian PC World*.

Australian Macworld is Australia's magazine for the Macintosh user community. It is published monthly and has a circulation of 9,500.

Communications World is CW Communications' newest publication reaching the Australian market. This monthly tabloid covers telecommunications, office communications and network management, and has a circulation of 10,000.

CW International Marketing Services makes advertising your products in Australia, and around the world, easy. We have over 55 publications in 28 countries. For advertising information, please call Frank Cutitta, Managing Director, International Marketing Services at 800-343-6474 (in MA 617-879-0700).



International Marketing Services
Australian Desk
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171
617-879-0700/800-343-6474
an International Data Group company

REACH OVER 70,000 FRENCH COMPUTER PROFESSIONALS.



Advertise in CW Communications' French publications and sell your products to the second-largest computer market in Western Europe.

Each week 25,000 MIS/DP executives read *Le Monde Informatique* to keep abreast of the latest developments in the industry.

Each month *InfoPC* reaches 30,000 IBM PC users and potential buyers. This publication has become France's leading monthly magazine dedicated to the IBM PC and compatibles market.

Distributique is read each month by 8,500 computer distributors and retailing professionals.

Le Monde des Telecoms is CW Communications' newest publication in the French market. This monthly tabloid is written for 10,000 telecommunications decision makers.

CW International Marketing Services makes advertising your products in France, and around the world, easy. We have over 55 publications in 28 countries. For advertising information, please call Frank Cutitta, Managing Director, International Marketing Services at 800-343-6474 (in MA 617-879-0700).



International Marketing Services
French Desk
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171
617-879-0700/800-343-6474
an International Data Group company

Thank you for making Computerworld number one... again!

Because of your continued support, we're proud to report that *Computerworld* has been declared, once again, the leader among specialized business publications in terms of gross advertising revenues.

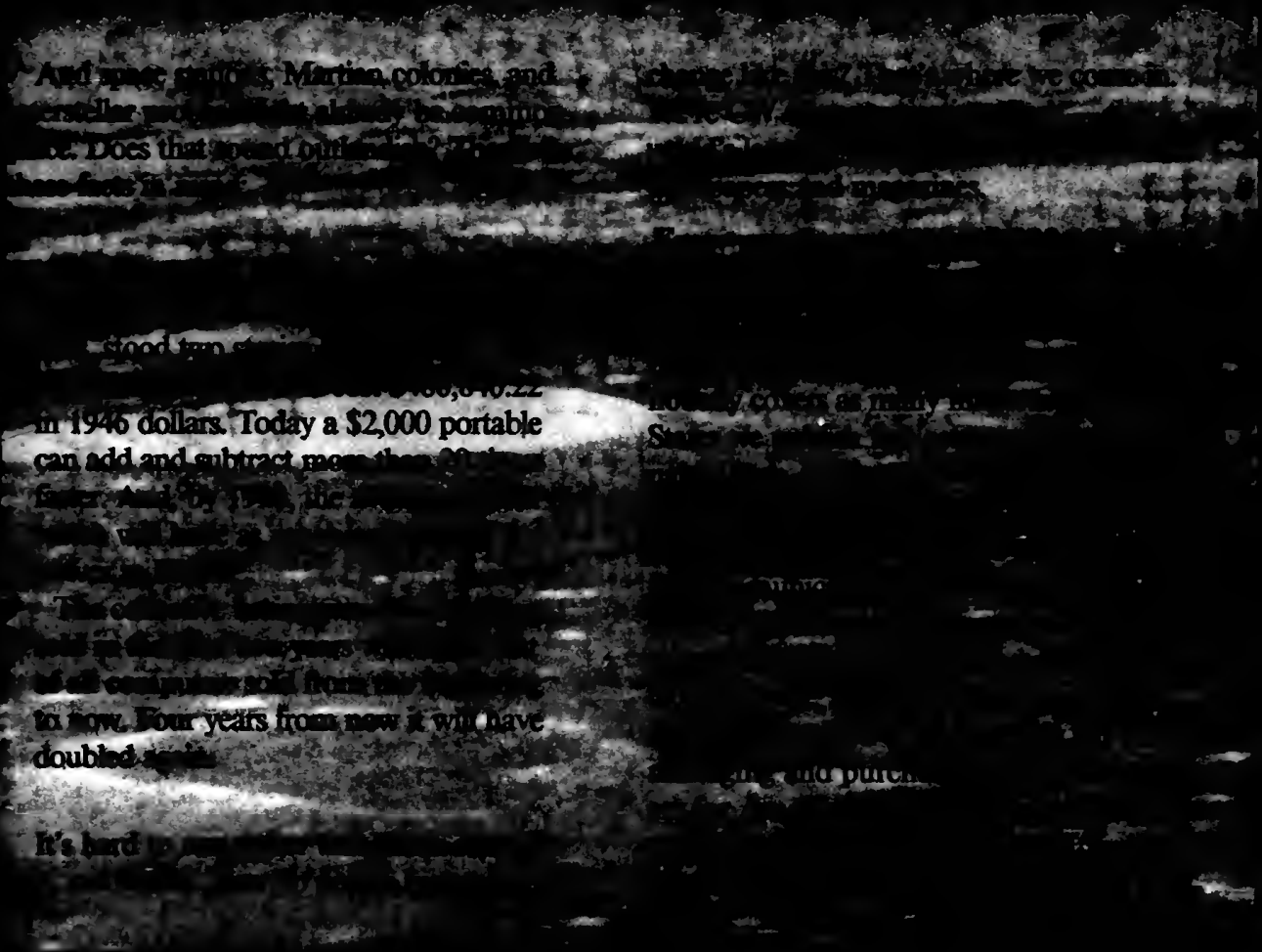
This top ranking of *Computerworld* for 1986 was recently reported by two independent media tracking services — Computer Publishing and Advertising Report, and C Systems Report.

Computerworld. We're dedicated to serving the growing needs of professionals in information technology. And we're dedicated to retaining our position as the largest specialized business publication of any kind in any industry in the United States. Your continued support makes it all possible.

COMPUTERWORLD

A CWCI Publication
An International Data Group Company

If the space program had advanced as fast as the computer industry, this might be the view from your office.





EMPLOYMENT TODAY

Money's not the only object

Job hoppers seek technical challenges, career growth

BY MICHAEL BALL
SPECIAL TO CW



Marvin Rubenstein, a senior EDP consultant for a large corporation, has changed jobs 15 times during his 33-year data processing career. Eight of those moves were either for the same money or for less.

"The work I left was so mundane, so prosaic, so dead-endish that when someone offered me the intellectual stimulation, I jumped at it," he says.

Rubenstein, like many of his peers in the DP field, has reached a level of experience at which creative challenge often outweighs a salary increase when it comes to making a career move.

According to recent surveys by Perlin Associates, Inc., a New York employment consulting company, when managers look at their current positions, they usually evaluate the following factors:

- First, whether they are working with technology they enjoy.
- Second, whether career advancement is open to them.
- Third, whether they are receiving sufficient compensation.

"We tell companies that these people find the challenge in the technology," says Roger O'Connor, a Perlin consultant. "They want to be in a position to define the technical specs and go the full life cycle of the project. They want to be part of the team."

In a generally well-paid profession, money is a major issue only for those with less experience, according to Arlen Lessin, president of Communications Consulting Corp., a market research firm in New York.

"Programmers tend to start at such a low level that they have to change companies to advance. People tend to get more money by making changes, even if they're fired," Lessin says.

But even at the programmer level, the creative nature of DP people and many other professionals is a factor in whether they leave or stay with a given company, says James Matteoni, MIS vice-president for Mattel, Inc. in Hawthorne, Calif.

"Programmers, analysts and technical support people in general tend to be artists hired to create something. Then, they want to finish what they start in a year or two. If they're in the middle of a project, they won't leave for 10% more salary. But if they're at the end, they may, if they don't see something else good where they are," he says.

Industry trends also affect DP turnover. In the Silicon Valley area, there has been less job changing this year because of recent corporate mergers and acquisitions.

Seeing their peers lose their jobs because of corporate takeovers causes many DP professionals to hold onto secure positions if they have them. In addition, the fallout from a merger can cause the market to become more competitive. For example, when Wells Fargo Bank, N.A. in San Francisco merged with Crocker National Bank in Los Angeles, many MIS professionals lost their jobs because there was a lot of duplication of positions, says Bob LoPresto, a recruiter with Korn/Ferry International, a Los Angeles-based executive recruiting firm.

These trends are reflected in Korn/Ferry's survey of present turnover rates. The West Coast rate is about 6%, in comparison with the national average of 10% for DP professionals. In addition, DP turnover rates vary by industry, LoPresto says.

"Some companies don't have enough money to invest in MIS. This is particularly true in low-margin industries such as banking and insurance," he points out, "and not at all in high-margin ones like pharmaceuticals."

In the Northeast, the DP turnover rate is also lower than usual this year because of recent layoffs at several major employers, such as Wang Laboratories, Inc., says Jack Erdlin, president of the search firm Management Dimensions, Inc., based in Wellesley, Mass. "Large layoffs make DP professionals a bit cautious," Erdlin suggests.

> "JOB hoppers find the challenge in technology — they want to define the technical specs and go the full life cycle of the project. They want to be part of the team."
>
> ROGER O'CONNOR
> PERLIN ASSOCIATES, INC.

At the same time that many employees have become more cautious, companies have become more clever about keeping them. Employment consultant O'Connor advises his corporate clients to "concentrate on other issues rather than just keep giving salary hits."

Besides ploys such as counteroffers of both money and more exciting projects, employers are using stock options to keep employees.

"In the past year, options are becoming quite valuable. Some people could be leaving a lot of dollars on the table if they left," Erdlin says.

Because options are often fully exercisable only over a period of three or more years, he says, "this helps lock people in."

The single most important thing a company can do to keep high-level MIS people is "treat them as a key part of the company instead of just a support function," Mattel's Matteoni says.

He defines another crucial area as returning loyalty for loyalty demanded. Companies often cut MIS budgets and fire people too quickly. Then many DP professional are loyal only to the MIS organization, the project or the boss. "When the boss leaves or the project finishes, they look around," Matteoni continues.

As a result, "Many kids leave with a bitter taste in their mouth," he adds. More and more of these professionals are not even looking for salaried jobs with other companies. Instead, they become independent contractors, often with the company from which they left or were fired.

Matteoni says he expects this trend to continue, at least until more companies give MIS greater influence.

Michael Ball is a Boston-based freelance writer.

Life Insurance Professionals,

challenge your skills and imagination in systems design and development. **Executive Life**, a leader in Life insurance is a fast-paced organization with state-of-the-art equipment, where your colleagues will be some of the best in the industry. In this **SENIOR PROGRAMMER ANALYST** position you will be responsible for the maintenance and enhancement of a life insurance support system. You will need a demonstrated understanding of life insurance concepts and perfected skills in modular design and structured top down design. 5+ years of experience. COBOL, OS/MVS, CICS, and strong analysis skills. Life/70 or related experience will be highly considered.

This position has outstanding growth potential. Executive Life offers a competitive salary, relocation packages, and unique benefits which include a Nautilus exercise facility, and an employee restaurant.

If you are an interested life insurance professional, send your resume in confidence to:

John McFarland

EXECUTIVE LIFE

11444 W. Olympic Blvd.
Los Angeles, CA 90064
(213) 312-2311

An Equal Opportunity Employer

NORTH CAROLINA MEMORIAL HOSPITAL

Due to program expansion, the Information Services Division of The North Carolina Memorial Hospital, a 650 bed teaching hospital located on the campus of the University of North Carolina - Chapel Hill, has available the following positions:

PROJECT ADMINISTRATOR

Will be responsible for establishing all aspects of computer system project administration. In addition, this position will evaluate, recommend and implement project management standards and supporting software. The Project Administrator works closely with the project leader to establish the project management framework and conduct ongoing project monitoring. This position reports directly to the Associate Director of Development and requires excellent project management skills and extensive projects management experience.

PATIENT MANAGEMENT SYSTEMS MANAGER

Will be responsible for implementing and supporting the hospital's patient management systems. Included is the hospital's recent implementation of the SMS Independence system. These systems facilitate the hospital's clinic appointments, ADT and patient accounting. This position will be directly responsible for six programmer/analysts and will report to the Associate Director of Development. Excellent project management skills and extensive experience with large system installations are required. Experience with SMS systems a desirable.

Both positions require a Baccalaureate degree and minimum 5 years progressive data processing experience. Graduate degree and university teaching hospital experience preferred. Salary open. Interested candidates should send a current resume to:

Chuck Kenshlo
Associate Director, Information Services
North Carolina Memorial Hospital
First Floor Anderson Pavilion
Chapel Hill, North Carolina 27514

An Equal Opportunity
Affirmative Action Employer

Data Base Administrator
SUPRA/TIS

Rochester Telephone has been consistently recognized as being one of the most efficient telephone companies in the world. Some of the major reasons for the company's success is the people we employ and our state-of-the-art IBM systems environment. In addition to the pride we have in our people/systems, we are continually looking at new ideas and procedures to improve our business.

We are currently looking to expand our Data Base area by adding a **Professional Systems Administrator.** This person will be responsible for creating and implementing relational data structures in support of the corporate data base. This individual must possess several years' experience in **CINCOM DATA BASE PRODUCTS** and be promotable into areas of increased responsibility. Excellent communications skills are required.

This position will be based in Rochester, NY rated nationally as one of the top five metropolitan areas for quality of life.

Send your resume to John Cegan, Employment Manager, Rochester Telephone, 600 Bilsley Tower, Rochester, NY 14604. Equal Opportunity Employer M/F. Principals only.

Rochester Telephone

OVERSEAS JOBS

TAX FREE INCOME

PROGRAMMERS/ANALYSTS
- IMS/CICS/ADABAS/IDMS
- RPG II, III/ORACLE/PCS

SYSTEMS PROGRAMMERS
- PRIMOS/VMS/AOS/MVS

SOFTWARE ENGINEERS
- CADCAM/UNIX-C

TECHNICIANS
- IBM MF/HP/DEC-VAX

MANY OTHER FIELDS

We represent U.S. and foreign companies who are NOW hiring for overseas and domestic positions. You need a minimum of one year experience in your field.

LOCATIONS - EUROPE, FAR EAST, MIDDLE EAST, PACIFIC ISLANDS, USA

Please call
(213) 382-9999

Sunday 9am-3pm, Mon.-Fri. 8:30 am-5:30 pm or send resume in confidence to:

OVERSEAS CAREERS OF CALIFORNIA AGENCY

A Division of International Careers Agency, Inc.
3701 Wilshire Blvd., Dept. 222CW
Los Angeles, CA 90010
Advance fee required-REFUNDABLE.
Licensed and bonded as an employment agency

• Analysts • Programmers
• Software/Hardware

AWARD-WINNING EMPLOYMENT AGENTS AT YOUR SERVICE

During more than two decades of matching high tech professionals and employers nationwide, RSVP has won awards as top consultant for cooperative placements in both National Personnel Associates (240 firms) and the Middle Atlantic Assoc. of Personnel Consultants.

Our services to the select group of degreed, experienced applicants we accept include resume development, arrangement of interviews, and career guidance. Sorry, no trainees, executives, or aliens without permanent resident status.

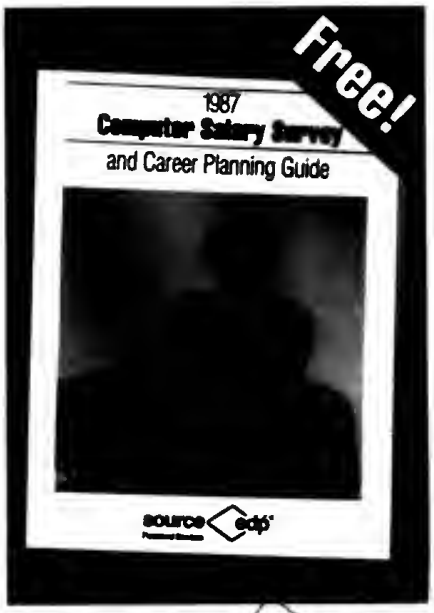
If you qualify, call Howard Levin or Maureen McCue at 800-222-0153 or (in NJ) 609-667-4488, or send your resume. Our client companies pay all costs.

RSVP SERVICES, Dept. C
One Cherry Hill Mall, Suite 700
Cherry Hill, NJ 08002
Member Firm
computer/net
national placement network

ONLINE & DATABASE
ATLANTA & SOUTHEAST
$25,000 to $60,000

[illegible]
EDP Consultants
[illegible] Bunker Hill Road
Suite 204
Marietta, Georgia [illegible]
404 971 [illegible]

Keep yourself up-to-date on salaries and careers in 1987



Understanding which technologies and markets are on the rise and which are on the wane can be important to your long-term career growth. If you keep up with new trends and tailor your professional plans accordingly, you can make sharp gains in your compensation and career.

Comprehensive data on industry trends and salaries

The new **1987 Computer Salary Survey and Career Planning Guide** is based on information from thousands of computer professionals and firms across North America. Over sixty position titles are reviewed including those in programming, systems analysis, software engineering, Edp auditing, office automation, operations, computer sales, marketing, technical support, management and more.

You'll learn whether your salary is keeping pace with your peers, what you can expect to earn as you advance, and how to direct your career by taking advantage of emerging trends.

Free to computer professionals

This valuable 24-page Survey is available without charge. Since 1966 we have distributed almost one million copies to other professionals like you who are determined to realize their fullest career potential. You owe it to yourself to be informed. Contact us today.

Call your nearest Source° office for a new, free Survey

United States:

Alabama
Birmingham 205/322-8745

Arizona
Phoenix 602/279-1010
Tucson 602/792-6575

California
Northern
Mountain View 415/969-4910
Sacramento 916/446-3470
San Francisco 415/421-3410
Silicon Valley 408/737-2434
Walnut Creek 415/945-1910
Southern
Fullerton 714/738-1213
Irvine 714/660-1699
Los Angeles
Downtown 213/688-0041
South Bay 213/540-7300
West 213/289-8111
San Diego 619/573-0100
San Fernando Valley 818/995-1330

Colorado
Colorado Springs 303/632-1717
Englewood 303/773-3700

Connecticut
Danbury 203/797-9999
Hartford 203/522-4666
New Haven 203/787-4666
Stamford 203/967-4999
Stratford 203/375-7245
Waterbury 203/574-5833

Delaware
Wilmington 302/652-5933

District of Columbia
Washington D.C. 202/293-8256

Florida
Fort Lauderdale 305/491-8145
Jacksonville 904/396-1620
Melbourne 305/725-3660
N. Miami Beach 305/940-1914
Orlando 305/282-9405
Pinellas 813/443-5460
Tampa 813/222-0007

Georgia
Atlanta/Downtown 404/688-6900
Atlanta/North 404/953-5500
Atlanta/Perimeter-400 404/255-2045

Illinois
Chicago/Loop 312/372-1600
Oak Brook 312/986-0422
Peoria 309/673-8274
Rolling Meadows 312/392-3344

Indiana
Fort Wayne 219/432-7329
Indianapolis 317/631-2660

Iowa
Des Moines 515/243-0191

Kansas
Overland Park 913/888-6885
Topeka 913/232-8722
Wichita 316/686-1621

Kentucky
Louisville 502/581-9900

Louisiana
New Orleans 504/581-3900
Shreveport 318/222-6199

Maryland
Baltimore 301/727-4800
Columbia 301/596-4884
Gaithersburg 301/738-8585
Greenbelt 301/441-5700
Rockville 301/258-8800
Towson 301/321-7044

Massachusetts
Boston 617/482-7015
Burlington 617/273-5160
Salem 508/666-7211
Springfield 413/739-4800
Wellesley 617/237-3130

Michigan
Detroit 313/259-7697
Grand Rapids 616/459-4589
Lansing 517/484-4881
Southfield 313/352-8530
Troy 313/362-9570

Minnesota
Bloomington 612/835-5100
Minneapolis 612/332-9400
St. Paul 612/227-8100

Missouri
Kansas City 816/474-5555
Clayton 314/862-3800
St. Louis, Westport 314/576-4444

Nebraska
Omaha 402/346-6700

New Hampshire
Nashua 603/888-7600

New Jersey
Atlantic City 609/345-3444
Cherry Hill 609/488-5400
Clifton 201/473-5400
Edison 201/494-3999
Morristown 201/267-3222
Paramus 201/845-3555
Princeton 609/452-7277
Somerset 201/469-5444

New Mexico
Albuquerque 505/247-4270

New York
Albany 518/465-3888
Buffalo 716/688-0400
New York City
Grand Central 212/557-6611
Penn Station 212/736-7445
Wall Street 212/943-4888
Rochester 716/385-3570
Syracuse, Ll. 516/364-4888
Syracuse 315/422-3411
White Plains 914/684-4488

North Carolina
Charlotte 704/552-6677
Greensboro 919/378-1155
Raleigh 919/847-7005
Winston-Salem 919/724-0535

Ohio
Akron 216/535-1150
Cincinnati 513/769-5500
Cleveland 216/771-3570
Columbus 614/224-5555
Dayton 513/461-4660
Toledo 419/242-3501

Oklahoma
Oklahoma City 405/722-7410
Tulsa 918/599-7700

Oregon
Portland 503/223-5169

Pennsylvania
Allentown 215/776-6024
Harrisburg 717/761-8780
King of Prussia 215/265-7250
Philadelphia 215/665-1717
Pittsburgh 412/281-6540
Reading 215/374-6230
Somerset/Wilkes-Barre 717/855-5464

Rhode Island
Providence 401/751-5005

South Carolina
Columbia 803/256-7445
Greenville 803/271-7044

Tennessee
Chattanooga 615/265-5600
Memphis 901/522-9743
Nashville 615/259-0825

Texas
Austin 512/472-0100
Dallas 214/954-1100
North 214/387-1600
Northeast 214/699-1100
El Paso 915/532-4216
Fort Worth 817/336-6900
Houston
Downtown 713/751-0100
San Antonio 512/699-0100

Utah
Salt Lake City 801/566-3600

Virginia
McLean 703/790-5810

Washington
Seattle 206/454-5400
Spokane 509/838-7577

Wisconsin
Green Bay 414/432-1184
Madison 608/251-0104
Milwaukee 414/277-0345

Canada:

Alberta
Calgary 403/270-1940
Edmonton 403/488-1153

British Columbia
Vancouver 604/222-1155

Manitoba
Winnipeg 204/942-1151

Ontario
Kitchener 416/745-3344
Toronto 416/391-1110
Willowdale 416/496-1551

source edp° Personal Services

The world's largest computer-based personnel service is the exclusive property of Dun & Bradstreet Software Services, Inc.

Department 705, P.O. Box 7100, Mountain View, CA 94039
(When writing, please include your title.)

SENIOR SYSTEMS ANALYST
POS CONTROL SYSTEMS

MORRISON, INC., a well-established leader in cafeteria and restaurant dining, is seeking an experienced Senior Systems Analyst with point-of-sale control systems background. Specific experience with POS systems for fine dining restaurant establishment is highly desirable. Qualified candidates should possess 5 or more years experience in data processing with the most recent involvement in POS control systems. Expertise in systems design and analysis is required. Candidates should be familiar with NCR 2160, IBM PC based systems and "touch" screen/mouse pointing hardware. Communication with an IBM Host using Synchronous protocols is also required. This position is based in our Mobile, AL corporate headquarters. We offer a competitive starting salary, good benefits programs and professional growth opportunities. Please forward resume with salary requirements, in confidence, to:

Attn: MIS Department
MORRISON, INC.
4721 Morrison Drive
Mobile, AL 36625

EXPERIENCED SYSTEMS PROGRAMMERS, ANALYSTS AND PROGRAMMER ANALYSTS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency and frustration are the biggest obstacles to overcome to achieve one's career goals. Everyday new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Raschke CPC, Data Processing Specialist.

Dunhill
OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28226
800-438-3912
(NC Call) (704) 542-0912

MANAGER PC PRODUCT DEVELOPMENT

Come to the most livable city in the USA. Pittsburgh, PA-based software-consulting firm seeks highly skilled PC Development Manager. The qualified candidate must have prior software company management experience in PC software development. Must be thoroughly grounded in IBM PC technology and PC/mainframe communications, have a strong business/products sense and be a proven people manager. Knowledge of ORACLE, FOCUS and other 4th GL systems a plus.

Firm is developing proprietary PC solutions for the financial services industry. Send resumes and references for this position in confidence to: John M. Schiller, Vice President.

MANAGER MAINFRAME PRODUCT DEVELOPMENT

This position requires an experienced manager of mainframe R&D. Individual must be a proven technical and people manager and familiar with rule-based software. Experience with IBM mainframe systems and on-line applications required. Send resumes and references for this position in confidence to: Cathleen Lewis, Senior Vice President.

Company has worldwide client base with a long and proven track record. Excellent working conditions and benefits package for the qualified candidates.

Innovative Systems Inc.
341 Fourth Ave.
Pittsburgh, PA 15222-2161
EOE

NEW ENGLAND

BOSTON
MVS SYS. PROGRAMMER
BOSTON area corp. seeks lead tech. specialist for diverse sys. enhance.+install proj. Environ. is IBM 3081X OS/MVS, CICS, VTAM, JES, IMS w/planned XA conv. Outstanding mix of benefits +quality tech. challenge. Salary to $45,000.

BOSTON
PROJ. LEADER - RETAIL
Fast-growing Fin. 128 retail firm seeks proven proj. ldr. to oversee retail, POS, + acct. appls. devel. Environ. is IBM MVS COBOL. Oppty. to join new MIS team as it builds systems to support future growth. Salary to $44,000.

BOSTON
PROJECT LEADER — VAX
BOSTON based svcs. firm seeks tech. astute pro. w/leadership skills. Previous VAX/VMS, COBOL, BASIC, FMS, 4GL req. Oppty. to guide a small staff in full cycle proj. devel. Salary to $35,000.

HARTFORD
CICS
3+ yrs. in appls./tech. sys. using CICS qualifies for S. New England oppty's. w/CTIMA clients. Full reloc. offered. State-of-the-art co. Exp. w/VTAM D.B. sys. desired. Salary to $40,000.

HARTFORD
TELECOMM'S
IBM SNA/SDLC, network planning, Data/Voice comm's. Bkgrd. oppty's. in CTIMA for Indiv's. with 3+ yrs. exp.! Excellent growth oppty's. in New England to this $30-$42,000 range.

PROVIDENCE
PROJECT LEADER
Join a firm w/outstanding growth record. Industry leader in fin'l. svcs. seeks seasoned PL to play key role in expanding MVS/XA; COBOL; IMS dept. Enjoy coastal lifestyle of RI w/full benefits and reloc. $45,000.

ROBERT HALF

EDP PERSONNEL SPECIALISTS
Contact the Manager of any office listed below.

100 Summer St., Boston, MA 02110
(617) 423-1200
111 Pearl St., Hartford, CT 06103
(203) 278-7170
900 Turks Head Bldg., Providence, RI 02903
(401) 274-6700
Client Companies Assume All Fees.

DEVELOPMENT CENTER SPECIALISTS

Ætna Life & Casualty has immediate openings in our **Windsor, Connecticut** facility for experienced Development Center Specialists. These challenging opportunities are available to qualified individuals who have a thorough knowledge of state-of-the-art systems design and development methodologies and are familiar with mainframe, micro and mini computer systems development. **It offers the chance to explore exciting and innovative technologies and methodologies to establish the systems development process of the future.**

The individuals selected will be responsible for providing technical and analytical support in the use of new technologies (4th GLs, application generators, relational technologies, etc) and methodologies to the application development staff. **Additionally, your experience in a large IBM or DEC environment using COBOL, JCL, CMS, MVS and DOS will be relied upon in setting future directions in systems development.**

To qualify, you'll need 5 or more years experience in systems design and development with a strong background in data processing hardware, software, communications, utilities, multiple software products, file servers (e.g. Novell) and personal computers. Previous experience in development center activities will be highly regarded. Good verbal and written communication skills, with an ability to interface with all levels of systems personnel are a must.

Ætna Life & Casualty offers a competitive salary and a generous benefits package. Please send your resume to Lea Hendon, Ætna Life & Casualty, Recruiting, Dept. 0642, 151 Farmington Avenue, Hartford, CT 06156 or call (203) 273-4008. An equal opportunity/affirmative action employer.

Ætna

WORK WITH THE BEST IN THE BUSINESS!

HOW VALUABLE ARE YOU?

The three most important factors in seeking a career change are job satisfaction, upward mobility, and money. We primarily work with a select group of "Fortune 500" companies throughout the Southeast who offer all of the above not to mention dental, savings plans, and many more. Our objective is to match not only your technical skills but your personalities with our clients.

You will be represented on a one-to-one basis which completely eliminates the mass mailing of your resume. We seek DP professionals who have at least 2 yrs. exp. with IBM or mini computers. If you want to know your true market value and desire to be represented by a well established agency with over 7 yrs. exp. please call Robert Rodriguez personally collect at 919-787-4388 or send resume to:

The Data Group
P.O. Box 52055
Raleigh, NC 27612

Perdue University Calumet

Department Head of Information Systems and Computer Programming, position starting July 1, 1987. The department consists of 11 full-time faculty, approximately 500 majors, and offers an applications-oriented program granting BS and AAS degrees.

A Master's degree is required. Applicants must have sufficient experience in computer-related areas, teaching, administration and business data processing.

Competitive salary and benefits, rank commensurate with qualifications and experience. Application deadline: April 6, 1987.

Perdue University Calumet is a 7,000 plus student, urban university located in northwest Indiana approximately 25 miles from Chicago loop, in a heavily computerized industrial area.

Contact: Dr. John Manoleas, Chairman Search Committee, Information Systems and Computer Programming, Perdue University Calumet, Hammond, IN 46323.

PUC is an Affirmative Action/ Equal Opportunity Employer

Programmer Analyst for Securities Brokerage firm in LA, CA for design and analysis of financial trading system; new system design and analysis, program specification, program coding and testing and debugging; data collection and gathering; system conversion, interface with software house personnel, evaluate software systems, etc. Must have BS in Computer Science, Math or Eng. and 3 years exp. Excellent skills in COBOL, CICS, RPG II & III, IDEAL, DATABASE Management, IBM 4381 and IBM System 36. $3,000 per month, please send ad and reply to CW-84989, Computerworld, Box 9171, Framingham, MA 01701-9171.

RESEARCH TRIANGLE OPPORTUNITIES

Urgently recruiting experienced computer pros with background in any of the following: IBM Cobol, CICS, DB2, IMS, Adabas, Oracle, T&T SQL, 4GL, Datacom or Ideal, PL/1, Financial, Mfg, Banking, Claims Processing, MSA, MVS, SCP, VTAM, CICS or DES, VAX, Systems Progrs., DASD, Mgmt. Capacity Planners, Basic, DB Analysts, DP Business, HP 3000, DEC, VAX Mfg., DG, Math or Spec Num. 2, SDM, Prod. Performance, Office Systems Analyst, Top paid positions & Benefits.

The Underwood Group, Inc.
1824 Browning Pl., Suite F
Raleigh, NC 27609
919 782 1074

HP 3000/WANG VS

Established software company needs HP 3000 & WANG VS Programmer for varied and challenging jobs entailing R&D/customer support/software maintenance/systems work and troubleshooting. Must have 2+ years COBOL experience with HP 3000 or WANG VS. MCBA experience a plus. Excellent salary, work environment and technical growth.

MCBA
425 W. Broadway
Glendale, CA 91204
818-242-9600

NORTHWESTERN COLLEGE (IA) has a faculty opening in Computer Science for 1987-88 and is seeking candidates with commitment to a Reformed expression of the Christian faith. Possibility of a term or tenure-track appointment. Responsibility for teaching both introductory and upper level courses in a developing undergraduate major in Computer Science which may eventually include courses in Information Systems/Technologies. Requirements include a masters degree in Computer Science or a related field, with a doctorate in Computer Science preferred. Submit a letter of application, with curriculum vitae, to Dr. Harold Heie, Vice President for Academic Affairs, Northwestern College, Orange City, IA 51041. An Equal Opportunity Employer.

LAI and YOU...

together can reach the greatest heights in software development.

LAI is a computer consulting and software development firm with exciting and challenging opportunities in Chicago, Columbus, Denver, New Jersey, and other locations. We are looking for Computer Scientists and Engineers with a minimum of 2 years experience in areas such as:

- UNIX® O/S development (System V & 4.xBSD)
- Network Communications (NFS™, RFS, X.25, & TCP/IP)
- Telephony (ISDN, #5 switch, OSPS, & ODD)
- and/or systems software

LAI offers a comprehensive benefit package and competitive salaries. Projects are performed at varying client and LAI sites. For consideration, send your resume to:

Lachman Associates, Inc.
1901 N. Naper Boulevard
Naperville, IL 60540-1031
Staffing - CW

LAI is an EOE
UNIX is a registered trademark of AT&T
NFS is a trademark of Sun Microsystems, Inc.

NorthEastern Mortgage Company, Inc., the fastest-growing mortgage lender in the northeast, seeks an experienced professional looking for a career opportunity for the following position:

Application Programmer

Responsibilities include design, coding, testing and implementation of application programs and systems, analyzing/resolving program problems, documentation of current application programs and systems; and, source code changes to A.D.S. software. We require 1+ year experience with Wang VS with mortgage experience preferred. IBM PC experience a definite plus.

In return for your expertise, we offer the highest salaries in the industry, excellent benefits and promotion from within. Please forward resume in confidence to: **TINA CUNNINGHAM, 1105 Commonwealth Avenue, Boston, MA 02215.**

An Equal Opportunity Employer

SENIOR RESEARCH ENGINEER/ SYSTEMS PROGRAMMER

The University of Illinois at Urbana-Champaign has an immediate opening for a full-time academic professional Senior Research Engineer/Systems Programmer in the Coordinated Science Laboratory. The Coordinated Science Laboratory operates a computer facility with a Gould 8050, two VAX 11/780s, VAX 750, over two dozen Sun workstations and other miscellaneous minicomputers. Duties and responsibilities will include: 1) system software installation and maintenance; 2) consulting with faculty, staff and student users; and 3) training of student programmers and operators.

Minimum requirements include an MS degree in electrical engineering or computer science, at least 5 years experience with computer programming in at least three languages, and at least two years experience with the C programming language. The candidate must have experience with Berkeley Unix 4.2BSD systems internals, demonstrated ability to configure hardware systems and upgrades and ability to interact effectively with a broad spectrum of faculty and staff.

Minimum salary is $32,000; salary depends on qualifications. In order to ensure full consideration, applications must be received by March 15, 1987.

Send resumes including names of at least three individuals who can be contacted for references to Lorraine Sellender, Assistant Director, Coordinated Science Laboratory, 1101 West Springfield, Urbana, Illinois 61801 (217) 333-2515.

The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

DIRECTOR OF APPLICATION DEVELOPMENT

Only An Experienced Leader Can Direct Our Key Programming Projects.

Leading banking software company needs a top caliber Systems and Programming Manager. Located in Orlando, Florida, we are growing very rapidly and need a strong leader to take the helm of a small programming team and a number of important projects. This is a tremendous opportunity for the person having the right credentials.

To qualify for this position, you need to be experienced in banking applications—specifically:

- **4-6 years of COBOL or RPG II/III programming**
- **2-4 years of project management experience**
- **2-4 years of line management experience**
- **1-2 years of application systems analysis and design experience**

The compensation plan is open, depending on qualifications.

If you have the right qualifications, please submit you resume in confidence to:

CW-8488, Computerworld, Box 9171, Framingham, MA 01701-9171

COMPUTER SCIENCE INSTRUCTOR

One year position (probable second year). Teaching areas in COBOL and business data processing, information systems analysis, design and implementation. Masters Degree required. Send letter of application, vita, transcripts of graduate study, and names and identities of three references by May 1, 1987 to.

Mrs. Jeanne Kruse
Administrative Assistant
Office of the Provost

Augustana College
Sioux Falls, South Dakota 57197

EEO/AA Employer

Programmer Analysts

Major clients in the SOUTHEAST are seeking experienced D.P. Professionals with COBOL or ASSEMBLER, with an IDMS, IMS, DATACOM, or CICS background.

Call or send resume to:

DMI DataMasters

P.O. Box 14049, Dept. CW
Greensboro, NC 27415-4049
(919) 373-1481 - collect

FEE PAID

When you don't have time to find the job you want

Searching for a better job can be a full time job. That's why so many data processors, who want to make a change, don't. Or worse, they take the next job offer that comes along.

If you can relate to this problem, Robert Half-Data Processing may be just perfect for you.

We're sensitive to the problem of the data processing professional, who wants to be fair to the present employer, and at the same time finds it necessary for career advancement to look for another job. Robert Half has been successful at discretely locating the right career positions for data processors—ever since the computer revolution began.

We can help you just as we've helped thousands of other professionals for almost 40 years.

If you must make a change, but can't spare the time for an interview during work hours, just call one of our 100 offices on three continents during a regular work day. Briefly explain your problem to one of our placement professionals, and we'll set up an in-depth phone interview at your convenience—after hours or on the weekend. If it's convenient for you to meet with us, so much the better—we'll arrange the interview.

And if you don't have a current resume, we'll discuss all the pertinent facts with you and compile them for presentation to suitable employers.

Please understand this: Our service is 100% free to you. And, equally as important, we're success oriented. This means our clients only pay our fees when they hire through us. This makes us better. *A lot better.*

So, if you're interested in finding a better data processing job, call one of our nearby offices. A few moments of your time now, may be the beginning of a new and brighter future.

ROBERT HALF® DATA PROCESSING

© 1986 Robert Half International Inc
Offices independently owned and operated.

FACULTY POSITION LIBERAL ARTS COLLEGE

Tenure track faculty position in liberal arts college starting August 1987, teaching undergraduate courses in Department of Computer Science with 80 majors and 60 minors in 2 tracks -- Computer Science and Information Systems. M.S. in Computer Science, commitment to teaching in liberal arts setting. Ph.D and teaching experience a plus. Rank open, competitive salary and benefits. For details and full description contact John Kershenstyer, Chairman, Dept. of Computer Science, Mount Union College, Alliance, OH 44601, (216/821-5328) by March 15. Send resume, graduate transcript, and three letters of recommendation. Affirmative Action/Equal Opportunity Employer

PHOENIX, AZ Honeywell Systems

Indecon, a leader in professional services is expanding to Phoenix and has immediate needs for EXPERIENCED SYSTEMS PROGRAMMERS and Programmer Analysts using Large Honeywell systems. Work with DS IV COBOL-74, GCOS, DPS or MULTIX is required. Indecon offers Excellent Salary, Comprehensive Benefits and Relocation Assistance to selected candidates. For a CONFIDENTIAL Discussion of our needs, call or write to: Roger Johnson, Dept. 8207, (317) 634-9482

INDECON, INC.
One American Square
Suite 1325 - Box 82066
Indianapolis, IN 46282

equal opportunity employer

COMPUTER PROFESSIONALS The Northeast Is Hot!

We provide professional, confidential and targeted placement throughout the Northeast, using our extensive computerized data base and personal contacts.

IMS, IDMS, CICS, COBOL, UNIX, C, PASCAL, ASSEMBLER are but some of the skills our clients seek. All expenses paid.

Dennis M. Sheehy, Vice President
Williams Barratt & Company
111 Commercial St., Portland, ME 04101
(207) 774-9100

GARRETT TURBINE ENGINE COMPANY

Join **Garrett Turbine Engine Company**, the world's largest and most respected designer and manufacturer of small gas turbine engines. We currently have the following opportunity available at our **Phoenix, Arizona** facility:

IMS Data Base Administrator

Candidates must have experience with DBD and PSB gens, restart/recovery procedures. 4 years minimum DP experience, including 2 years as DBA, is required. Data Communications or Systems Programming background is desirable.

In return for your expertise, Garrett offers an excellent salary and benefits package. If you qualify, and if you're interested in a challenging future, send your resume and salary history in confidence to: **David Host, Garrett Turbine Engine Company, Employment Office, P.O. Box 5217, CW32-87 DH, Phoenix, AZ 85010.**

An equal opportunity employer M/F/H/V

Allied Signal Aerospace Company
GARRETT

MAINE - N.H.

We have specialized in data processing professional placement in Maine & N.H. for a fifth of a century. If you qualify for positions in the $25-60,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.

Att: Dept. 2
P.O. Box 7040 DTS
Portland, Maine 04112
(207) 772-6760

DIAGNOSTIC PROGRAMMER

R Squared Scan Systems, Inc., a leader in independent service on computerized medical x-ray systems nationwide, has a need for a Diagnostic Programmer at our Corona facility. The systems we service utilize Data General Eclipse and MV computers but contain a variety of special purpose interface boards and subsystems that must be repaired by our service engineers. We need a top notch individual experienced in writing diagnostic routines for the purpose of identifying and isolating component failures. If you possess a BSEE and the necessary experience please contact us. We offer an excellent compensation package that includes salary, health benefits, relocation, and much more. Please send your resume in confidence to: R Squared Scan Systems, Department of Human Resources 16118 Pomona Rd., Corona, CA 91720

SAN FRANCISCO BAY AREA

There's GOLD in those skills.

Discover the reward experienced systems professionals can earn through challenging career opportunities as:

DBA'S
Physical or Logical Design
IDMS, IMS, DATACOM

Logical Options

One Market Plaza, Spear Tower, Suite #2914
San Francisco, CA 94105 • (415) 777-2000

Software Specialist

Where can your software talent take you?

To General Electric Neutron Devices in Largo, Florida. Here you'll find increased challenge working on vital components to support the nuclear weapons complex ... all the growth advantages of a Fortune 10 industry leader ... and an attractive lifestyle with low cost-of-living advantages.

Play a strategic role.

As a major contractor of the Department of Energy we look to you to provide high-level technical assistance and guidance to individuals from all functions of Computer Systems Support. You'll be instrumental in the development of software standards, procedures and techniques to ensure proper implementation of all modifications to the operating system and supporting software. As principal contact between vendors and Computer Systems Support you'll also help maintain and update all existing system software.

Your technological credentials

A BA/BS in Engineering, Mathematics, CS, Business Administration or a combination of education and experience is required. You must have knowledge of DEC computers, MACRO-11 and FORTRAN languages, and the capability to develop DCL command procedures. Experience should also encompass installation, maintenance and tuning of RSX11M/M Operating System for the PDP-11 and VMS Operating System release 4.2 for VAX series, and knowledge of cluster management and installation/maintenance of DECNET.

Industry-leading rewards

To learn more about our exceptional compensation, benefits and career prospects within a prestigious unit of the GE Aerospace Business Group, send resume with salary history in confidence to: Christie Souder, General Electric, P.O. Box 2908, Largo, FL 34294. U.S. citizenship required. No phone calls please.

GENERAL ELECTRIC

An equal opportunity employer

DATA PROCESSING OPPORTUNITIES

1-800-423-5383

Our clients in the SUNBELT and throughout the U.S. have HUNDREDS of current needs.

LIFE INSURANCE	To $60K
SYSTEM/36 RPGIII	To $40K
DATA COMMUNICATIONS	To $64K
IDMS, IMS or ADABAS	To $60K
P/A (COBOL or ALC)	To $40K
CONSULTING	$ OPEN
MVS or VM INTERNALS	$ OPEN
ACF/VTAM/NCP	To $60K
DATACOM/IDEAL	To $60K +
DB2/SQL	$ OPEN
HONEYWELL-Bull	To $48K

Call or send your resume to:

ROBERT SHIELDS & ASSOCIATES
P.O. Box 890723, Dept. C
Houston, Texas 77289-0723
In Texas Call: 713/488-7961

Junior Software Engineer

A large Boston area professional firm is seeking a Junior Software Engineer for their Data Processing Department. Primary responsibilities of this position include:

- Development of relational database applications systems.
- Maintenance and support of various third party applications software packages.

Qualifications for this position include a BA/BS Degree, at least two years of experience in an applications development environment, with one year in a DEC VMS environment using the "C" programming language. Experience with the UNIX operating system and INGRES relational database would be very helpful. Good communications skills with both technical and user staff are required.

Please submit resume with salary info to:
CW-84692, Computerworld, Box 9171,
Framingham, MA 01701-9171

Assistant Database Administrator

The Clinical Research Department of Pfizer Central Research has an opening for a talented, high-energy individual with an MS in Information Science, Computer Science or an equivalent, and 1–2 years experience in programming/system design including database management. Previous experience with ORACLE and FORTRAN is also desirable.

You will be responsible for: providing technical support for the Clinical Research database; assisting in the on-going exchange of data between our Groton, CT and Sandwich, England facilities; providing support for data archiving, processing outside tapes and setting up new accounts; monitoring ORACLE backups, space utilizations and other computer functions; providing general user support.

This position offers an excellent opportunity for professional recognition and growth. We offer a competitive compensation and benefit package. Located in Groton, Connecticut, Pfizer Central Research is in the midst of attractive shore communities, one hour from New Haven, Hartford, and Providence. Please send resume to: Leighton K. Gleicher, Personnel Associate, Pfizer Central Research, Eastern Point Road, Groton, CT 06340.

Pfizer

An equal opportunity employer

Geisinger

MIS Professional Opportunities
IBM Environment

Geisinger System Services is the management support unit to a 569-bed tertiary care medical center, 230-bed acute care hospital and several other health care affiliates. Our centralized DP system with multiple location users provides data processing professionals with state-of-the-art challenges and advancement opportunities. Our on-line environment utilizes an IBM 3083 with MVS, CICS, TSO/ISPF, VTAM and FOCUS plus multiple VAXs with VMS ethernet and MUMPS. Continued growth in our MIS department has created career opportunities for:

Assistant Manager of Technical Resources

Five years technical support and/or systems software experience with at least two years supervisory experience required. Experience with the installation of IBM software (MVS/XA, VM, CICS, TSO, VTAM via SMP/E) as well as non-IBM software required. Capacity planning experience including tracking and projection skills for major system components (CPU, MEMORY, DASD) required. BS in Computer Science, related field or equivalent experience required.

VM Systems Programmer

Responsible for system software support, problem resolution, maintenance upgrades, new versions, performance, etc. Current environment is VM/SP HPO 3.4 RSCS, GDDM, VMAP. Minimum of two years experience in a VM/SP environment required. Familiarity with PICK, PROFS, VM/XA a plus. BS in Computer Science, related field or equivalent experience required.

GEISINGER SYSTEM SERVICES

All applicants must demonstrate the ability to work independently and have excellent communication skills. We are seeking experienced, aggressive individuals who are extremely user oriented. Geisinger System Services offers an excellent compensation package and a full range of benefits. For consideration, send your resume including salary history and requirements to **Human Resources Department, Geisinger System Services, Danville, PA 17822.** E/O/E/M/F/H.

SOFTWARE DEVELOPER. Utilizing knowledge of computer communications and multi-layer protocol networks based on an auto mata (finite state machine) model, implement (including specifications verification), test, analyze and enhance the MFC (Multifrequency Compelled) signalling protocols in 5ESS switching system for toll and local offices, using UNIX operating system and programming in C language. Candidate must have completed all degree requirements for receiving a M.S. in Computer Science. No experience required, but graduate study should include a project in implementing a three-protocol-layer network predicated on a finite state machine model. Graduate studies should also include two courses in Computer Communications. Salary: $27,000/yr, 40 hrs/wk, Mon. - Fri. 8 a.m. - 5 p.m. Send resume, along with documentation supporting above requirements to: Illinois Department of Employment Security, 401 So. State Street, 3-South, Chicago, IL 60605. Attn: Marie Nirvanian, Ref. #9851-N. An Employer Paid Ad.

ACCOUNTS RECEIVABLE COMPUTERISTICS SOFTWARE PACKAGE
Part Time Help Needed
(Manhattan Area)

Seeking MIS Specialist with in-depth Programming experience with Batch and On-Line using DOS/VSE plus ability to change to MVS/XA and upgrade logic. If you have solid experience, contact Nick Johnson, Director.

PolyGram Records, Inc.
810 Seventh Avenue
New York, NY 10019
212/333-8407

SOFTWARE ENGINEERS

Challenge your skills with Simmonds Precision, a dynamic leader in the development and manufacture of superior avionic performance systems for fifty years. Succeed in our quality environment that offers you the opportunity to work in small groups on a wide variety of state-of-the-art projects as program needs and individual preferences allow. Enjoy our beautiful Vermont setting that will let you take advantage of some of the most outstanding cultural and recreational activities found in the Northeast with easy access to Burlington International Airport, Boston and Montreal.

Our Instrument Systems Division sets the industry standard for electronic fuel management, flight control and instrument systems. We seek the following with the proper experience and skills needed to effectively help design, develop and maintain our real time flight control software effort. ASSEMBLER, PASCAL or ADA required.

MANAGER/SOFTWARE DESIGN
LEAD SOFTWARE ENGINEERS
SENIOR SOFTWARE ENGINEERS

Compensation is competitive and the benefits are excellent including a liberal relocation allowance. For prompt and confidential consideration, please send resume and salary history to: **Gary Van Arsdale, Human Resources Department, Simmonds Precision Instrument Systems Division, Panton Road, Vergennes, Vermont 05491.** Affirmative action/Equal opportunity employer. U.S. citizenship is required.

Simmonds Precision
A Subsidiary of Hanson Incorporated
Where Technology Takes Flight.

Analyst, Operations Research - BA or BS in Quantitative-related major + 3 yrs experience graduate education in quantitative major substitutable for exper. in yr for yr basis. Analyses of broad & complex corporate problems/projects through use of computer-based models/operations research methods required. Able to use PL/1, FORTRAN on IBM mainframe. Assist in defining problems, project design/develop analytical models to describe problem, design/develop computer models to test solutions, perform extensive analysis of problem, model, resources available & alternative solutions, recommend best solutions, analyze strategic capital, operating expenditures & procedures, & interpret magnitude, consequences, trends, etc. $32,500/yr. Permanent residence or US citizenship required. Qualified applicants submit detailed resume & copy of ad to: Jack Hamsen, Tennessee Job Service, 1295 Poplar, Memphis, Tenn 38104.

Systems Analysts Programming

The continued growth of our company necessitates the need for additional technical support. Please consider the following opportunities immediately available:

- Analyst - Bachelors Degree in Computer Science plus three years related experience. Thorough knowledge of the VAX/VMS system. Financial systems/simulation software knowledge a plus.
- Programmer - Associates Degree in Computer Science with a minimum of two years experience handling financial applications. Working knowledge of the VAX/VMS system and COBOL.

Our Information Services group provides an excellent opportunity for growth - as well as diversity in systems applications. We are located just north of Dayton, Ohio and offer a comprehensive compensation and benefits package including company bonus and relocation assistance. To further pursue these excellent career opportunities, please send your resume and salary requirements to: Assistant Personnel Manager, Box 783, Sidney, Ohio 45367.

System Analyst-Microcomputer Applications for company in S.W. Ohio. Devise or modify procedures to solve complex problems using personal computers, keeping in mind the capacity and limitations of the equipment, operating time and form of desired results; prepare clear and specific instructions from which programs will be written; analyze and revise existing programs as system logic difficulties are encountered; act as internal consultant providing technical guidance to program staff. Requires B.S. in Physics or B.S. in Mathematics or Computer Science or Operations Research. Must have experience through academic program or otherwise in writing systems programming on personal computers in BASIC language and with Microsoft-Disk Operating System (MS-DOS), 40 hr wk, $480 per week. Qualified persons reply in confidence with resume to: L. Ellison, JO #1077401, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.

NEW DATA CENTER

OVER 200 OPENINGS

Our client, a household name, is opening a new Data Center in Los Angeles with multiple IBM 3090s, MVS/XA based on its New York Data Center which is being upgraded. All new development projects. Staffing requirements are:

IMS Programmer Analysts - All Levels
IMS Project Leaders
Data Base Analysts/Administrators
CICS Programmer Analysts - All Levels
CICS Project Leaders
Applications Development Managers
Assembly Language Programmers

SYSTEMS PROGRAMMING

MVS Systems Programmers XA or SP
IMS Systems Programmers
CICS Systems Programmers
VTAM/NCP Systems Programmers
VM/SP Systems Programmers
Testing and Planning Analysts

Positions are available for both the Los Angeles and New York/New Jersey Data Centers.

CONTACT:

Systems and Programming Careers
5665 E. 7th St., Ste. 227
Long Beach, CA 90804
(213) 431-6716

or

Mitchell/Martin, Inc.
80 Wall St., Ste. 1215
New York, NY 10005
In New York **(212) 943-1404**
In New Jersey **(201) 659-2888**

NOW IS THE TIME ... FOR PROJECT THE SOUTHEAST

Numerous positions for Junior to Senior level professionals (some management) with any of the following skills:

SYSTEM PROGRAMMERS
MVS, CICS, IMS or DB-2

LEAD SYSTEM PROGRAMMER
Multistate (MVS, CICS, Database)

PROGRAMMER ANALYSTS
VAX (ORACLE, INGRES, FORTRAN)
IBM (CICS, DB-2, ADR, IDMS)

PROJECT LEADER
VAX (ORACLE or INGRES)
Pharmaceutical or the industry blgd.

SYSTEMS ANALYSTS
IBM (FOCUS or CICS)
Sales/Marketing, or distribution applic.
Pharmaceutical or the industry blgd.

CALL OR WRITE
BRENDA CAREY, CPC

AMOS & ASSOCIATES
8338 Chapel Hill Rd.
Burlington, NC 27216
Phone: 919-222-0331

COMPUTER SCIENCE

Ph.D. preferred; MS with teaching experience considered. Teaching responsibilities: introductory and advanced courses in BS and BA degree programs. Send resume and the names of three references to: John Silmick, Computer Science Search Committee, University of Pittsburgh at Bradford, Bradford, PA 16701. Application deadline: April 15, 1987. UPB IS AN AFFIRMATIVE ACTION/ EQUAL OPPORTUNITY EMPLOYER.

PROGRAMMERS/ANALYSTS

Align yourself with the finest minds in information processing.

Join an alliance of more than 1800 professionals who have propelled AGS into its position of leadership in Systems Design and Development. As an AGS data processing consultant, you will have the opportunity to work with the finest minds and industry leaders... OUR CLIENTS. In addition to the challenge and diversity of working on state-of-the-art projects, you will receive an outstanding salary, training, and an extensive benefits package. You will have a real say in selecting your technical or managerial career path and relocation is negotiable. Your personal growth is unlimited.

Immediate opportunities available for individuals with:

- DB2
- IDMS/ADSO
- RAMIS/FOCUS
- IMS DB/DC
- ADABAS/NATURAL
- SQL
- CICS
- COPICS
- VSAM
- PL/1
- VAX

If you are ready for the challenge, diversity, growth and personal reward that a career with AGS will bring, send your resume in confidence, or call:
Norman Merkin, Dir. of National Recruiting, (201) 654-4321,
AGS Information Services, Inc.,
1139 Spruce Drive, Mountainside, N.J. 07092.

Equal Opportunity Employer M/F

AGS *An Alliance of Minds*

SDA is now a part of AGS Information Services, Inc

33 LOCATIONS

ARIZONA
Phoenix

CALIFORNIA
Los Angeles
San Diego
San Francisco

COLORADO
Denver

CONNECTICUT
Hartford
Norwalk

DELAWARE
Wilmington

FLORIDA
Fort Lauderdale
Orlando

GEORGIA
Atlanta

ILLINOIS
Chicago

MARYLAND
Rockville

MASSACHUSETTS
Boston

MICHIGAN
Detroit

NEW JERSEY
Clark
Fort Lee
Mountainside
Princeton

NEW YORK
Jericho
Melville
New York City
Wappingers Falls
White Plains

OHIO
Cincinnati
Columbus

PENNSYLVANIA
Philadelphia

TEXAS
Austin
Dallas
Houston

UNITED KINGDOM
London

Also serving the Federal Government marketplace.

COMPUTER PROFESSIONALS

with good writing skills to evaluate computer software for national syndication. Part-time, contract stringer. Must have access: IBM PC, AT, MAC or compatible clones. Send resume: Software Programmers News, 830 Bay #G, Dept B, Capitola, CA 95010.

STAFF SYSTEMS DESIGNER: Responsible for coding programs in PL/1 lang, testing programs which have been coded by using sample data, & prep of documentation to turn these programs over to production. Participate in overall systems testing as req'd. Participate in dept processes such as trainee recruitment & systems stress testing. Perform onsite carrier operations to assist testing & production req's. Responsible for designing computer systems providing traders & brokers wired-line trading information & stock news run on Stratus Real-Time Quote System using PL/1 lang. Must have BS Computer Sci or any science field using computer + 5 mos training MIS major investment banking environment. Must have exp in ADABAS, Natural & API. Exp in use of Stratus PL/1. Exp in MVS/JES2, JCL & VTAM. 40 hrs/wk, M-F, $33,500/yr. Contact: T. Ebert, Morgan Stanley, PO Box 14, 1633 Broadway, NYC, NY 10019.

PROGRAMMER/ANALYSTS

North Carolina division of a rapidly growing consulting firm needs professionals with 3 or more years experience for Charlotte, NC & Greenville, SC assignments. Company paid benefits including profit sharing and resort condominium usage. Skills required are:

- IDMS/ADSO
- DEC/VAX/FORTRAN
- ADABAS/NATURAL
- IMS
- CICS

Send resumes to:

METRO
Information Services, Inc.
Attention: Kathy Beebe
Steven Parkway Plaza, Suite 140
Charlotte, NC 28217

CAROLINAS TO FLORIDA

Over 500 Client Companies (2 yrs. min. exp.)
- ALL FEES PAID -
SALARIES $21,000 TO $47,000

MVS Sys Prog's & CICS Sys Prog's Sys 36/38 P/A's P/A's IBM BANKING
P/A's IDMS/ADSO DBA's IDMS/IMS/ADABAS P/A's CICS/DL1/IMS/M204 S/A's IMS DB/DC
P/A's ADABAS/NATURAL P/A's IDEAL/DATACOM P/A's TANDEM/DEC/HP P/A's MSA, DB2, MRP

OLD COLONY GROUP, INC.
Call or write Ron Boerter, Reg. Mgr
4401 Colwick Rd., #210 Charlotte, NC 28211
Call Collect 704-366-1047
HQ's "AMERICA'S TECHNOLOGY HIGHWAY"

COMPUTER PROFESSIONALS

Senior Financial Systems Analyst

- Naples, Florida

Progressive county shop with VAX and PDP has immediate opening for a seasoned pro. Degree, heavy municipal financial systems VMS and Cobol experience required. Starting salary to mid 30s, plus excellent benefits.

Send resume and salary history to Richard Laymon, Director Of MIS, Collier County Clerk Of Courts, P.O. Box 413666, Naples, Florida 33941

SUNBELT SOUTHWEST
200+ OPENINGS TO $55K

Immediate need for P/A's, DBA's, and Systems Programmers with experience in DB2, IMS or CICS. Also seek Scientific/Engineering P/A's with FORTRAN 77. Contact:

Superior Resources, Inc.
6016 Pollasky Ave.
Suite 350-D
Los Angeles, CA 91367
(818) 884-3888

All Fees Employer Paid

UNIX/DB DEVELOPERS

ProTec is an expanding, UNIX-oriented consulting firm seeking software developers with database experience. Prefer IBM/PC in Comp Sci/EE with strengths in UNIX (Sys V or 4.2 BSD), database development (any DB acceptable), and C or Ada®. Personal growth opportunities with challenging projects. We are Ohio's specialists offering a very competitive salary and benefits package, plus the opportunity to work with the best in the field.

The Protec Group Inc.
3941 Kenny Road, Ste. 300
Columbus, OH 43221
(614) 457-8868

UNIX is a trademark of Bell Labs

WANTED: EDP EXCELLENCE

Numerous positions available at all levels, including MIS Directors/Managers, Systems Managers, Project Managers/Leaders, Systems Analysts, Programmer Analysts, EDP Consultants, EDP Auditors, Decision Support. Key Positions in Business and industry available coast to coast. All fees employer paid.

As veteran recruiters for Blue-Chip corporations, we have advantageous opportunities for outstanding professionals.

Contact: JOHN SOWERS
MARVEL CONSULTANTS, INC.
3500 Orange Place
Beachwood, OH 44122
(216) 292-3500

PROGRAMMER SR P/A
--$35-40,000--

Well known downtown financial institution seeks programmers with 4+ yrs business exp & a good handle on CICS & VSAM. ASSEMBLER would be a plus. Bonus, great bnfts. F/PDI

[illegible] SELF
[illegible] YORK, Inc.
522 Fifth Avenue
New York, NY 10036
212-221-[illegible]

Data Processing

The Washington Public Power Supply System, located in Richland, Washington, is a municipal corporation, building and operating major electrical generating facilities including the state's only commercial nuclear power plant. We have opportunities for DP Professionals in the following areas

SYSTEMS PROGRAMMER

This individual will serve as a Systems Programmer and will be responsible for the planning, implementation and maintenance of an MVS/XA operating system on an IBM 4381-14 computer which will be installed in June. Will also be responsible for on-going maintenance and support of associated software including CICS, TSO/E, JES2 and ACF/VTAM.

The position requires a Bachelors Degree in Computer Science and 10 years of experience in Systems Analysis and Programming, 4 of which should include responsibility for on-going maintenance and support of IBM computer operating system software (MVS-SP, MVS-XA). Leadership and proficient communication skills are a must to communicate complex data processing requirements to technical and non-technical personnel.

TECHNICAL ANALYST

This position is responsible for hardware and system software support and maintenance for a configuration of five Prime computer systems including four Model 750 and one Model 9955II computers. This individual will serve as System Administrator and specific duties will include: 1) hardware and software product evaluation and implementation; 2) overall system configuration management; 3) systems security; 4) general administration of the computers.

The position requires a degree in Computer Science or equivalent and a minimum five years of progressively more responsible experience in data processing, including a demonstrated knowledge of Prime computer hardware and software products. Effective writing and oral presentation skills are essential.

Responses must be received no later than March 13, 1987. Qualified candidates may submit a resume including compensation history to: Mona Taylor, Dept. T17-J4, Supply System, P.O Box 968, Richland, WA 99352. An equal opportunity employer

WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

DIRECTOR OF PERSONAL COMPUTING. Provide strategic & operational support to the introduction & use of personal computers for computer an int'l basis to improve timeliness of business objectives/info transfer. Acquire hardware & software. Closely liaise w/executives & user expertise gained in Finance, Marketing, Manufacturing & MIS. Assess req'ts of Int'l headquarters in terms of information & analysis provided. Travel to overseas affiliates to provide training to key employees & executives on use of personal computers & applications that are developed. Provide guidance & support in the new areas of: accessing external data bases using emerging telecommunications, transfer of information between US headquarters & overseas affiliates through telecommunications, linking of Mainframe computers to personal computers. Expertise in/heavily dealt tools & techniques in the areas of hardware, software education. Req's several of computerized systems used in manufacturing, marketing, selling, financial & all/an areas of the business, knowl of medium-sized computers & personal computers, computerized business applications & of problems in their implementation. Must know info strategies & plans & ability to dvlp innovative ideas. Also req Bachelor's degree in accounting or computer science/data processing, 5 yrs exp in Int'l Computer Systems dvlpmnt & implementation or 1 yr in the job offered. 40 hr/wk, 8:30 - 5:00, $50,000/yr. Resume to NYS Job Service, JO 0650067, DOT 191.067-014, 1800 New York Ave, Huntington Station, NY 11746.

WORLD VACATION

We're an international executive search/consulting service firm needing talented D.P. professionals.

DB-2 all levels
IMS DB/DC all levels
CICS/COBOL/ASSEM
BANKING/LOANS
HOGAN/URISHELLA
SYSTEM 36 P/A's
DOS/SVS SYSTEM36 P/A's

Openings are in California, Texas, Arizona, Colorado with Fortune 500 firms. When we place you, at no expense to you, we will send you to any city in the world, one week, airfare, hotel and nominal expenses. We have permanent openings for the above skills, so please call and forward resume to:

Superior Computer Services
4140 Norse Way
Long Beach, CA 90808
(213) 429-3722

P.S. We've been giving these rewards since 1974, and you can take the trip or use monies to relocate, your choice.

THE OHIO SUPERCOMPUTER PROJECT
AND
THE OHIO STATE UNIVERSITY

The Ohio State University has openings for five systems and applications programmers to serve in the newly established Ohio Supercomputer Project. The Project will take delivery on June 1, 1987 of a Cray X-MP/24 computer with SSD to run the UNICOS operating system. We are seeking a senior systems programmer who will lead the systems and applications programming group. The successful applicant must have broad experience in Cray systems programming as well as experience with the UNIX timesharing system and be an innovative problem solver. We are also seeking systems and applications programmers to maintain the operating system, communications software and scientific/engineering software packages. Experience with Cray computers, FORTRAN and C languages, UNIX timesharing system, and the VAX VMS operating system are of desired but not of essential. Salaries will be commensurate with experience. The Ohio Supercomputer Project will operate with funding from the state of Ohio, and these positions are open immediately. To apply, send resume and three letters of reference to Ohio Supercomputer Project, 199 New Chemistry Building, 120 West 18th Avenue, Columbus, Ohio 43210. The Ohio State University is an Equal Opportunity, Affirmative Action Employer.

PERMANENT OR SUBCONTRACTORS

Programmers
Programmer Analysts
Systems Analysts

We need data processing professionals with three years experience in:

IBM - COBOL, IMS DB/DC, CICS, IDMS, RPG II, RPG III
IBM - HOGAN SOFTWARE
TANDEM - COBOL, PATHWAY
SPERRY - HEWLETT PACKARD

Please forward resume to:

Integrated Computer Services Inc.
5100 Poplar Avenue, Ste 2518
Memphis, TN 38137
(901) 761-7812

PROGRAMMER/ANALYST: Design, develop & enhance specialized financial programs for co. invoiv. extensive mathematical calc. & forecasting for fin'l planning & salary projection syst. adhering to rigid workforms, interactive user contact & formal documentation standards. 2 yrs exp. Req: Bach - Math or Comp. Sci. Must know: COBOL, CICS, DOS/VSE, data structures, mathematical modeling & programming, numerical analysis, statistical computations & frg IBM mainframe hardware. $30,000/yr, 40 hrs/wk, ADC Information Services, Inc. 1139 Spruce Drive, Mountainside, NJ 07092. Send resume: S. Huvane (#300).

Data Processing

Systemhouse

There's never been a better time to join us in:

Pacific Region

Midwest Region

Systemhouse is one of the largest and fastest growing systems integrators in the industry. By applying leading technologies to information problems, we've delivered some of the most complex and successful systems solutions to our clients.

Our dynamic growth has created opportunities for experienced and highly motivated professionals in the following areas:

Systems Analysts
Programmer Analysts
Programmers

Requirements include experience in one or more of the following

IBM BURROUGHS

Also required is experience in one or more of the following.

ADABAS NATURAL LINC
COBOL CICS

Additional experience in any of the following areas is highly desirable:

Mini/Micros
Communications Protocols
Distributed Processing
Welfare Systems

All positions require relocation for 12-18 months.

For immediate consideration and to arrange an interview, send your resume in confidence to:

Beth Jenkins
Manager, Professional Resources
Systemhouse Inc.
1010 N. Glebe Road, 2nd Floor
Dept. CW-3
Arlington, VA 22201

An Equal Opportunity Employer.

MIS Professionals

It could take you forever to find a career with all the flexibility you want. Or a few minutes.

Call Today



ADABAS	HOGAN	OS
BASIC	HP	PATHWAY
BURROUGHS	IBM	PL/1
"C"	IBM PC	RAMIS
CICS	IDMS DB/DC	RPG II, III
CMS	IMAGE	SDLC
COBOL	IMS DB/DC	SNA
COPICS	LAN	TAL
dBASE II	MAPICS	TANDEM
DBMS	MARK IV, V	TPNS
DMS	MPE	UNIVAC
DOS/VSE	MVS	UNIX
FOCUS	NCP	VAX
FORTRAN	NATURAL	VMS
GUARDIAN	NOMAD	VTAM

Join America's leading supplier of contract MIS professionals for systems and applications software related to transaction processing.

EDP/Temps and CONTRACT SERVICES

An Affirmative Action/Equal Opportunity Employer

BALTIMORE
7133 Rutherford Rd
Baltimore, MD 21207
(301) 265-6500

BOSTON
15-19 Crawford St
Needham Hghts, MA 02194
(617) 449-6884
One Center Plaza
Boston, MA 02108
(617) 723-6111

CHICAGO
2115 Butterfield Rd
Oak Brook, IL 60521
(312) 620-7171

CLEVELAND
1440 Snow Road
Parma, OH 44134
(216) Tel-3080

DETROIT
17117 W. Nine Mile Road
Southfield, MI 48075
(313) 569-6560

LOS ANGELES
15445 Red Hill Ave
Tustin, CA 92680
(714) 259-1850
800 S. Figueroa St
Los Angeles, CA 90017
(213) 624-5870

NEW YORK
225 W. 34th St
New York, NY 10001
(212) 947-6033

ORLANDO
1001 Executive Center Dr
Orlando, FL 32803
(305) 896-9027

PHILADELPHIA
301 City Line Ave
Bala Cynwyd, PA 19004
(215) 667-2590

SAN FRANCISCO
901 Sneath Lane
San Bruno, CA 94066
(415) 952-5010

STAMFORD
37 North Ave
Norwalk, CT 06851
(203) 847-8800

WASHINGTON, D.C.
2095 Chain Bridge Rd
Vienna, VA 22180
(703) 893-2400

3L

© 1986 Technical Aid Corporation

INFORMATION SYSTEM PROFESSIONALS

High Technical Challenge In An Entrepreneurial Atmosphere

Teco Technologies, an affiliate of Teco Energy Inc., is an IS consulting/services firm that is undergoing world market growth. Currently, we have opportunities for professionals who understand the IS challenges that face utilities and related businesses. You will travel extensively to client sites and assume key projects in Primary IBM environments.

Opportunities now exist for these proven professionals

- **PROJECT MANAGERS**
- **SYSTEMS ANALYSTS**

Above positions require previous experience in Materials Management Systems, Customer Information Systems, Employee Information Systems, Accounts Payable Systems.

- **SYSTEMS PROGRAMMERS**
- **DOS TO MVS SPECIALISTS**

At Teco Technologies, you will pursue your career in an entrepreneurial atmosphere — providing both personal and professional growth. We offer highly competitive salary, excellent benefits, travel expenses and bonus, advancement opportunity, and much more. Forward your confidential resume today to:

TECO TECHNOLOGIES, INC.
A TECO ENERGY AFFILIATE

P.O. Box 21688
Tampa, Florida 33622

An Equal Opportunity Employer M/F/H/V

SERIES 1 PROGRAMMERS

St. Louis Series 1 shops are expanding with new applications and lots of challenge. Positions involve EDX/EDL, Assembler, Protocol Conversion, Communications. Salaries to $40,000.

TANDEM PROGRAMMERS SYSTEMS PROGRAMMERS

Rapid growth in a service firm has spawned several positions for TANDEM Applications Programmers and Systems Programmers. Minimum one year experience on TANDEM 16B program using COBOL, Pathway, Guardian and TAL. Salaries will range to $45,000 plus fabulous benefits and relocation.

CONSULTANT SERVICE
Data Processing
7735 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

---

expert: (eks' purt)

a person with a high degree of knowledge or skill in a particular field.

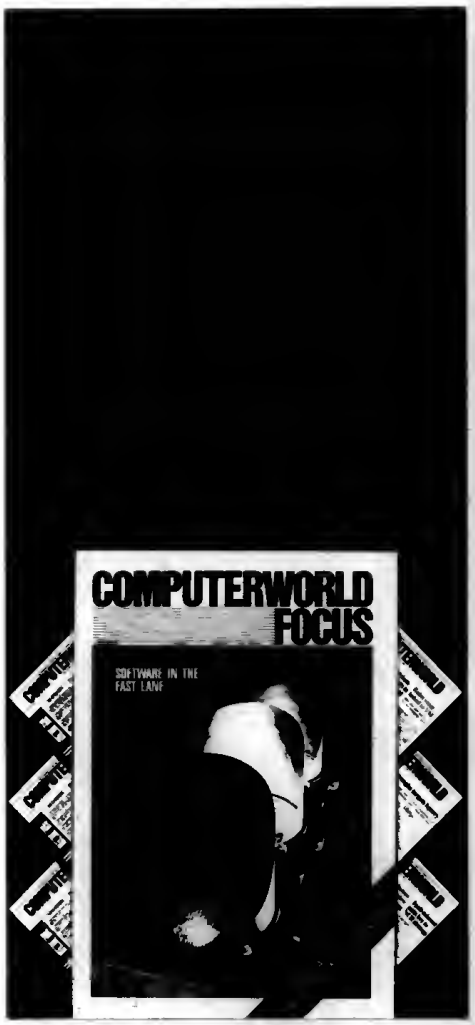
Quality? Available?

The EXPERTS have numerous contract and permanent opportunities available:

BOSS/GMAP/DMV INTERFACES
DATAPOINT/DATABUS
BANK/RETAIL/BANKING
SYSTEM 36
TANDEM/TAL, "C"
HOGAN
ARTHUS
ADABAS, IDMS, OR IMS

Full Time/Part Time

contact: The Experts
(703) 750-5550
6911 Richmond Hwy.
Alexandria, VA 22306


COMPUTERWORLD
FOCUS
SOFTWARE IN THE
FAST LANE

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY

CIRCULATION DEPARTMENT

COMPUTERWORLD

P.O. Box 1016
Southeastern, PA 19398-9984

MS or PhD in Computer Science

Conceptual Leadership in Application Development Methodology

We are firmly committed to such a leadership effort. In our view the primacy of rigorous logical design is beyond question, with data modelling the driving force. We seek out principles of state-of-the-art programming languages for on-line systems (e.g., ADA, MODULA-2) and apply them in our present DBMS/COBOL environment while looking ahead to a more advanced environment.

Our current develoment methodologies are quite advanced, but we want to go a lot further and need a few more key people to help us do it.

We are a $200m catalog retailer of fashion goods, building for $300m in 1988, and $500m in 1990. Perhaps you have seen our catalogs:

J. Crew
Popular Club Plan
Clifford & Wills

Qualifications

MS or PhD in Computer Science.

Experience with formal system development methodologies.

Strong verbal aptitudes.

Desirable: some experience in commercial systems development.

Send resume with cover letter listing qualifications to:

Popular Services Inc.
22 Lincoln Place
Garfield, N.J. 07026 (a New York City suburb)
Attn: John Witherington
V.P. Human Resources

TO ADVANCE YOUR CAREER—

Choose from 100s of top, new career openings—nationwide

Put our entire team of EDP placement specialists to work for you

When you're dealing with something as vitally important as your career advancement, we believe you need the fullest possible choice among the outstanding career openings in your field—clear across the nation.

That's why we've assembled the nation's foremost EDP placement specialist firms into a unique coast-to-coast partnership called *computer/net*, a division of National Personnel Associates, the nation's largest intercity placement network.

By combining and sharing our *computer/net* resources, we're able to match your qualifications with the literally hundreds of outstanding current EDP career opportunities being offered throughout the U.S. by our client companies, which include the nation's largest as well as the fastest-growing and most dynamic. Your career planning deserves nothing less than our best.

CALL OR SEND YOUR RESUME TODAY. OUR CLIENT COMPANIES PAY ALL EMPLOYMENT COSTS.

ALBUQUERQUE: Prof Personnel Placement P.O. Box 10500 Albuquerque, NM 87184 • (505) 345-6861

ATLANTA: Mau, Inc 360 Bay St. Suite 180 Augusta, GA 30901 • (404) 722-6806

BOSTON: Burton Personnel Service Inc 186 Lincoln Street Boston, MA 02111 • (617) 482-1950

CHATTANOOGA: Interstate Pers Assoc Suite 407 Osborne Office Center Chattanooga, TN 37411 • (615) 892-2868

COLO. SPRINGS: Computer Bus. Systems 1715 Monterey Road Suite 220 Colo Springs, CO 80915 • (303) 635-4588

COLUMBUS: H & S Inc 760 Northlawn Drive Columbus, OH 43214 • (614) 459-5422

DENVER: Career Marketing Associates 7100 E. Belleview Ave. Suite 14-CN Englewood, CO 80111 • (303) 779-8880

DURHAM, NC: VIP Personnel Inc P.O. Box 2861 Durham, NC 27705-0861 • (919) 471-6404

FORT WAYNE: Tower Personnel Services, Inc 5112 Constitution Drive Ft. Wayne, IN 46804 • (219) 436-5627

HARTFORD: Vannah-Rowe Inc 11 Mountain Avenue Bloomfield, CT 06002 • (203) 243-0424

IRVINE/ORANGE CO.: Int'l Staffing Cons. Inc 19762 MacArthur Blvd Irvine, CA 92715 • (714) 752-6228

L.A./ORANGE CO.: Computer Prof. Unlimited 7411-D Garden Grove Blvd Garden Grove, CA 92641 • (714) 891-1244

NEW YORK: Executive Directions, Inc 2 Penn Plaza, Suite 1185 New York, NY 10121 • (212) 594-5775

NEW YORK: Mitchell/Martin Inc 80 Wall Street, Suite 1215 New York, NY 10005 • (212) 943-1404

PHILADELPHIA: RSVP Services Dept. C1 One Cherry Hill Mall # 700 Cherry Hill, NJ 08002 • (609) 667-4488

PORTSMOUTH, NH: EXETER 2100 Computer Park P.O. Box 2180 Hampton, NH 03842 • (800) 258-7328

POUGHKEEPSIE, NY: Ethan Allen Personnel 59 Academy Street Poughkeepsie, NY 12601 • (914) 471-9700

ST. LOUIS: Jack Crowley & Associates 111 S. Bemiston, Suite 200 Clayton, MO 63105 • (314) 726-6377

SYRACUSE, NY: DAPEXS Consultants, Inc One Pers Place Syracuse, NY 13202 • (315) 474-2477

TAMPA, FL: Availability Inc Dept. N P.O. Box 25434 Tampa, FL 33622 • (813) 872-2631

npa computer/net

A PART OF THE FAMILY OF NPA NETWORKS

Programmer Analysts

Advance Your Future Today . . . At Bendix

Bendix Aircraft Brake & Strut Division of Allied Bendix Aerospace has immediate openings for Senior Programmer Analysts in its Information Systems and Services Group.

Work in the exciting aerospace field in a state-of-the-art environment developing a major on-line manufacturing system.

Responsibilities include:

- perform project planning; cost/benefit analysis; system analysis and design
- write program specifications, and
- program, test and implement new systems.

Successful candidates should have a BS Computer Science or equivalent; with 3 years experience in systems development in an IBM environment. Experience developing and implementing DB/DC programs using COBOL, CICS, IMS, DL1, JCL and TSO is preferred.

Send resumes and inquiries to: Employee Relations, Bendix Aircraft Brake & Strut Division, P.O. Box 10, South Bend, Indiana 46624.

An equal opportunity employer

ALLIED Bendix Aerospace

Data Processing

SENIOR SYSTEMS PROGRAMMER

Continued expansion of Data Processing has created need for experienced MVS Systems Programmer. Minimum 3 years experience as an MVS Systems Programmer required. Knowledge of MVS, VTAM/NCP, 4341/4381 environment, 3350/3380 technology (conversion), JES, CICS, TSO/ISPF, system resource management.

Reply in confidence with resume and salary history to:

Manager of Employment
METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITY
20th Floor, P'tree Summit Bldg.
401 W. Peachtree St. N.E.
Atlanta, GA 30365-4301
An E/O/E-M/F/H

Next year is here.

We take the procrastination out of career planning.

By making sure you've got the right resume at the right place at the right time.

Right now.

Glad.

Instead of wishing you had.

The difference between a job and a career could begin here.

In Accounting/Finance, Banking or Data Processing (our people are professionals from the field in which we place you, well known and knowledgeable).

ROMAC® meet with success.

ROMAC
ROMAC & ASSOCIATES
Personnel Consultants.

Albany	Dallas	Milwaukee	Richmond
Atlanta	Dayton	Minneapolis	Rochester
Bala Cynwyd PA	Denver	Orlando	St. Louis
Baltimore	Detroit	Parsippany NJ	Tampa
Boston	Fort Lauderdale	Philadelphia	Washington DC
Buffalo	Hartford	Phoenix	Wellesley Hills MA
Charlotte	Houston	Portland ME	Wilmington DE
Chicago	Jacksonville	Portsmouth NH	Winston-Salem
Cleveland	Memphis	Providence	
Columbus	Milford CT	Raleigh/Durham	

Franchises available. Call Dick Merrick toll free at 1-800-341-0263.

Programmer for applications programming and systems analysis III sustaining information control operating system (ICCS). Design, testing and modification of software using diagrams, models and flowcharts using COBOL. Database creation using information management system (IMS) and prototyping. User liaison; system interface and evaluation of overall system efficiency. Prepares reports of all systems and software specifications. Must have minimum two years prior experience some job including: COBOL and CICS experience; technical writing ability; knowledge of prototyping; experience in database creation and systems interface. Hours Monday - Friday 8am - 5pm. Salary $0.00/month. Send resume only to Job Service Of Florida, 1980 NW 12th Avenue, Room 280, Miami, Florida 33042. Ref: Job Order # 4546913.

S/38 PROGRAMMER/ ANALYST

to create innovative and challenging systems for Eastern NC Food Broker

NO AGENCIES

2 YRS S/38
& RPG III REQUIRED

919-522-2022

HIGH-TECH BANKING

Our client, the 3rd. largest bankholding company in New England, has significant new development opportunities for Programmer/Analysts, Systems/Analysts, Project-Leaders, Software Specialists & Technical Data Base Analysts who have had a minimum of 3 years of commercial banking experience in a large-scale sophisticated IBM environment. Excellent relocation & compensation package.

COMPASS, INC.
900 Asylum Ave.
Hartford, Conn. 06105-1990
203-548-4240

"Member of National Computer Association"

Biostatistician for collaborative studies on the prevalence and prevention of heart disease. Review, design and implement SAS and other software systems to perform statistical analyses and data management. Master's degree in Biostatistics or related field and six months experience in educational research. Education and experience must include one year of advanced statistical computing and data management with SAS. Knowledge of collaborative studies and clinical trials. Salary $23,000. Contact the Job Service Office at 317 Caldwell St., Charlotte, Chapel Hill, N.C. 27514, or the Job Service Office nearest you. Refer to Job Order #NC 6166736.

COMPUTER PROFESSIONALS

Your Travel Agent couldn't offer more choices. And nothing even resembling the future with PRC.

These openings offer you more than rewarding travel experiences. Each opportunity also represents a career launching pad with an industry leader in problem solving with computer-based technology. The positions call for some background in maintenance programming on PDP 11/70s with MACRO-11 in intelligence applications.

Openings exist now in:

Washington, DC	Honolulu, HI
Sunnyvale, CA	Norfolk, VA
Tampa, FL	San Angelo, TX
Fayetteville, NC	Key West, FL
Heidelberg, W. Germany	

Coming soon:
Seoul, Korea

U.S. citizenship is required as well as the ability to undergo a rigorous background investigation.

For immediate consideration, please send your résumé in confidence to: **Jim Aquino, Planning Research Corporation, Government Information Systems, 1500 Planning Research Drive, Department JA-44, McLean, Virginia 22102.** An Equal Opportunity Employer M/F/H/V.

prc

Planning Research Corporation
Government Information Systems

Foothill-De Anza Community College District in the San Francisco Bay area invites applications for the following faculty positions for the 1987-88 academic year

ELECTRONICS INSTRUCTOR MA in Engineering or related technical area or BA in technical or vocational areas with 3 or more years electronic industry experience. Must be able to develop curriculum and teach in the area of electrical and electronic instruction. Deadline March 30 1987

DRAFTING/ENGINEERING INSTRUCTOR MS with minimum 2 years relevant industrial experience. Teach board drafting as well as computer-aided drafting and design, computer-aided manufacturing and computer-aided engineering. Strong interest in mechanical, architectural, piping, electronic printed circuit board, integrated circuit and logic simulation diagram drafting. Involvement in curriculum development. Deadline March 30 1987

Applicants must hold or be eligible for a California Community College Credential. Applications and complete job description may be obtained from Employment Services, Foothill-De Anza Community College District, 12345 El Monte Rd., Los Altos Hills, CA 94022 (415) 960-4529 AA/EOE

A resume or vita may not be substituted for a completed application

---

Computer Systems Analyst wanted to design and develop database management software for forecasting and planning systems using 'C' programming language and INFORMIX Database Manager in UNIX operating environment, and, design, develop and improve database management software for manufacturing inventory control using 'C' programming language and advanced mathematics on IBM PC (XT) and Victor 9000 in MS-DOS operating environment. Requires M.S. degree in Computer Science and Master's degree level course, one each in Computer Programming Languages, Compiling System Design, Operating System Design, and Data Management System Design. $30,000.00 per year, 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #8287 "Employer Paid Ad"

HUMAN RESOURCE INFORMATION SYSTEMS

The Hunter Group is a national Human Resource Information Systems consulting firm headquartered in Baltimore, with regional offices in Boston, New York and San Francisco. We work with clients throughout the country to develop strategic plans and define requirements; recommend and install software; and design, implement, and audit mainframe, minicomputer, and microcomputer Human Resource Information Systems to support all HR functions including pension, benefits, and payroll.

Tremendous growth has created openings at all levels for HRIS project managers, consultants and implementation specialists. Experience with Tesseract, McCormack and Dodge, Geneeys, MSA, Mainframe Micros and other HRIS products is very desirable. Disciplined independent work habits, good interpersonal and communication skills, and a commitment to quality are essential. Willingness to travel is a plus. Principals only respond in confidence to:

Mary Cephas
The Hunter Group, Inc.
Dept. CW-302
11 East Chase St., Suite 8E
Baltimore, Maryland 21202

The Hunter Group Inc

Programmer Analysts

Motorola's Government Electronics Group is creating advanced electronics for a more productive world. New business requirements have created opportunities for professionals experienced with IMS DB/DC, TSO and strong COBOL skills to work on a variety of applications. Knowledge of dBase III on an IBM PC a plus. Experience with financial, manufacturing, material and project management applications desirable. Degree preferred. Requires 3-5 years related experience. Background investigation may be required.

Join the professionals of Motorola's Government Electronics Group. The benefits are many. For consideration, forward resume to Bob Eddy at: Motorola Government Electronics Group, 8201 E. McDowell Rd., Dept. 8779, Scottsdale, AZ 85252; (602) 949-3759. An Equal Opportunity/Affirmative Action Employer U.S. Citizenship Required. Principals Only Please The Mind to Imagine THE SKILL TO DO

MOTOROLA INC.
Government Electronics Group
Advanced electronics for a more productive world.

SYSTEMS ANALYST. Provide analysis of systems for database & computer info req'ts for clients in chemical based industries. Define syst. req'ts & data structure. Design, implement, code, test & debug programs incl. to Chemical, Pigments, Fibers & Processing info Syst. Develop syst. back-up, recovery & data conversion procedures, enhance syst. design. 4 yrs exp or rel. Systems Analyst/Design Exp. Must Know: COBOL, IMS DB/DC, DL/1, ISPF, MVS, CMS, OS/VS utilities, DMS/VS utilities, JCL, syst. & structure design & database design. $37,500/yr. 40 hrs/wk. Kearns, Inc 242 Old New Brunswick Rd. Piscataway, NJ 08854 Send resume (Ref # JW-10)

Systems Analyst-Plan, sched, direct prep pgrms to process bus. data, solve pblms. Clarify pgrms intent, suggest change design/set up pgrms. Masters degree Computer science 9-5PM $432.00 wk 40 hrs. Report to: State of Florida, Dept of Labor, Job Serv. Order # FL5453600, 3421 Lawton Rd. Orlando, Fla. 32803

COMPUTERWORLD's EMPLOYMENT TODAY!

As the industry grows, so will **COMPUTERWORLD.** This is not a phrase we took lightly. We will continue to offer the high quality news coverage and editorial content that has attracted our readers since our beginning. But we also must continue to grow. What does that mean to you, our advertisers? Good news...in the form of wide exposure. We now will offer a feature topic to each weeks Recruitment ads. This will allow for us to target your specific market. In addition to the attractive format, it is easy to read. We offer a variety of topics which we have listed below:

March

3/16	Education and Training: what mix of courses and experience do employers prefer and how can it be obtained.
3/23	Breaking into government DP: how do you get a position with the government, where are the opportunities, what are the advantages/disadvantages?
3/30	Surviving a layoff: what are the best ways to get back on your feet?

So, as a nationwide publication, we give you the exposure you want. As a weekly publication, we give you the immediacy your advertisements need.

In addition Computerworld will feature a number of Product Spotlights in our Editorial pages that focus on one aspect of the computer industry and give our advertisers a chance to reach a more select audience. There will also be a number of issues distributed at shows **COMPUTERWORLD** will be participating in. We will also have bonus distribution of **COMPUTERWORLD** at these shows:

Bonus Distribution Issues

- March 23 - **NCGA Show**
- March 30 - **Interface Show**
- April 27 - **DEXPO Show**
- June 1 - **COMDEX Show**

Product Spotlights

- Mar 2 - **PC storage devices**
- Mar 16 - **Graphics**
- Mar 30 - **Modems**
- April 6 - **Desk Top Publishing**
- April 13 - **TI Equipment/Multiplexers**
- April 20 - **Workstations**
- April 27 - **DEC-Compatible Equipment**

COMPUTERWORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

Our mailing address is

COMPUTERWORLD
Classified Advertising
Box 9171
375 Cochituate Road
Framingham, MA 01701-9171

Or call for more information at **1-800-343-6474** or, in Massachusetts, **(617) 879-0700**

BUY SELL SWAP



no

NO DELAYS
NO INSTALLATION PROBLEMS
NO WORRIES
NO MIDDLEMEN
NO GUESSING
NO DISAPPOINTMENTS

WE BUY · SELL · LEASE
34 · 36 · 38 · SERIES 1 · 4331-4381
ALL PERIPHERAL EQUIPMENT
ALL UPGRADES

CALL: 800-238-6405
IN TN: 901-372-2622
IN NC: 919-884-0879

COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
"SINCE 1974"

IBM SYSTEMS, PERIPHERALS, UPGRADES

SYSTEM 36
SERIES/1
SYSTEM 38
SYSTEM 34
PC, XT, AT
4300/3080
DISPLAYWRITERS
DATAMASTERS S/23

BUY, SELL, LEASE 612/894-2200 BUY,SELL,LEASE
ALSO: FINANCE & OPERATING LEASES FOR ALL SYSTEMS & PERIPHERALS

Valley Computer & Financial, Inc.
12205 Nicollet Avenue, Burnsville, MN 55337



SALE OR SUB-LEASE
STC-4305
72 MEG.
BEST OFFER
Tom
(913) 491-3663

Buy * Sell * Lease

SERIES/1
SAVE ON NEW OR USED

S/38
4361
4341
ALL RELATED PERIPHERALS

S/34
ALL UPGRADES AVAILABLE

S/36
SHORT-LONG TERM LEASES

612-941-1099 800-328-4358

COMPUTER OPTIONS, INC.
The Best Option

IBM SPECIALISTS

800-251-2670

CMA
COMPUTER MARKETING

P.O. BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

For Sale
Gandalf PACX IV SE 1024 x 512
Gandalf PACX IV SE 256 x 128

For more information call
(519) 824-4120, ext. 2725.

Complete system includes port boards, Asynchronous Modem Terminal Boards, 125 Terminal Boards and disk software for backup and configuration. Approximately 600 LDS 125 modems. Many extras. Best offer.

SOUTHERN DATA SYSTEMS

SYSTEM 34 36 38
All Related I/O

MAINFRAME I/O
Terminals Printers
DASD Controllers

S/23 DATAMASTER
PC/XT/AT 5110/5120
DISPLAYWRITER

(Call Us Toll Free, Today!)
800-251-2614



IBM
TAPES
DISKS
TERMINALS
PRINTERS
800
258-2233

Inflation Fighters
Quality & Savings
Slightly used, Money Back Guarantee. Full Reels. All External Labels Removed. Guaranteed for use at 1600 BPI through 6250 BPI.
2400' Reel $4.95 ea.
1200' Reel $4.50 ea.
600' Reel $3.75 ea.
All Tapes with Hanging Seals
We pay freight on orders over 200 tapes. All orders shipped within 48 hours.
Call or Write
Computer Tape Mart
44A Sesbro Avenue
N. Amityville, New York 11701
(516) 842-8512

IF YOU'RE BUYING, WE'RE SELLING.
3300
IF YOU'RE SELLING, WE'RE BUYING.
(800) 331-8263
TOLL FREE
(213) 306-0343
CALIFORNIA
Ocean Computers, Inc.
8055 W. Manchester Ave., Ste 525
Playa Del Rey, CA 90293

3083 EX 16x16
3083 J 16x16
(800) 821-0229
(818) 986-2411

3704
3705 3725
BUY • SELL • LEASE
Call Toll-Free
800 532 7532
Centron DPL Company

IBM HARDWARE
BUY • SELL • LEASE
SERIES-1
S/34 • S/36 • S/38
S/23 • 4300 • PCS
MCGM
5555 WEST 78TH STREET
MINNEAPOLIS, MN 55435
612-829-7445 800-328-7723

SERIES/1
ECONOCOM USA
IS THE SOURCE FOR SERIES/1
• BUY
• SELL
• LEASE
NEW OR USED
ECONOCOM-USA, INC.
945 CROSSOVER LANE
P.O. BOX 240257
MEMPHIS, TN 38124
800-238-3696 or 901-767-6130

IBM Displaywriters
WANG
WPS OIS VS Equipment
CDB FINANCIAL INC
DALLAS, TEXAS

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY
Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201, (601) 359-1395, for the following equipment and services.
Request for Proposal No. 1188, due Thursday, March 19, 1987 at 3:30 p.m. for the acquisition of PROMACS programming services for the Corporate Information System for the OFFICE OF THE SECRETARY OF STATE. Charge $10.00
Detailed specifications may be obtained free of charge from the CDPA office or at the specified cost by submitting a written request accompanied by the appropriate payment. NOTE: Valid forms of payment are: corporate check on a Mississippi bank, certified check, or postal money order. NO CASH OR OUT-OF-STATE CHECKS. The CDPA reserves the right to reject any and all bids and proposals and all waive informalities.

Sale or Lease
3890-B05
(800) 821-0229
(818) 986-2411

BIDS & PROPOSALS

REQUEST FOR QUOTATIONS

West Virginia Network for Educational Telecomputing is soliciting quotations for a comprehensive software package for the total integration and processing of student information. The package will be used by the West Virginia Board of Regents institutions. Bids will be received by Monday, April 13, 1987 at 5:00 p.m. Bid forms and specifications can be obtained at the network business office, 1169 Pineview Drive, Suite G2, Morgantown, WV 26505 or by calling Mr. John Tapp at (304) 293-5192. Refer to Requestion #12891 when requesting information.

Make your call for
BIDS & PROPOSALS
here in
COMPUTERWORLD
Call
1-800-343-7474
or, in Mass.,
(617) 879-0700

THE BULLETIN BOARD

HEWLETT PACKARD

S/70 & S/68
Also
HP 2392A Terminals
Qty. Available
Quantity Pricing Available
All in stock - immediate delivery
Subject to prior sale
All warranted to qualify for manufacturer's maintenance
BUY • SELL • RENT • LEASE
Processors • Peripherals • Systems
From the HP 3000 Experts!
800/643-4954 213/829-2277
ConAm Corporation
It's Performance That Counts!

HP 3000 • 1000
9000 *and now* 250
Buy & Sell Worldwide
ENCORE
(213) 452-9117
Telex 756927

Sell Your Product
in the
BULLETIN BOARD

BURROUGHS

BUY SELL LEASE
BURROUGHS
B-20 to B-7900
SPECIAL 207 DISK
(10 Units)
B900 DISK PACK (206 Style)
Subsystem
DEPOT MAINTENANCE
Computer Provisions
(216) 248-7878

FOR SALE
Burroughs B5985
1) B5985 CPU 9.3 Megabytes
1) B9499-12 Tape Controller
2) B9495-3 Tape Drives 1600 BPI
1) 9387-41 Disk Controller 1x4
1) 9387-42 Disk Controller 2x12
1) 9387-2 Disk Exchange 2x12
2) B9484-4 207 Fixed Disk 8x200 MB
49) TD830 Terminals
For further information contact Mike Lindsay or Bill Birney at British Columbia Automobile Association, 999 West Broadway, Vancouver, BC Canada V5Z1K8 (604) 732-3911

PRIME

TSI
YOUR FULL LINE VENDOR FOR ALL YOUR PRIME COMPUTER NEEDS
TSI manufactures and supplies a full line of memory disk, tape and printer subsystems for the Prime computer environment. As the oldest, largest and most experienced third party vendor we have experienced it all. Give us a call - put our knowledge and expertise at work for you.
Buy • Sell • Lease • Rent
National 800-222-3475
Florida 800-421-4135
Northeast 800-874-3475
Timesharing Services, Inc.
4080 Woodcock Drive
Jacksonville, Fl 32207

LARGE SELECTION OF USED PRIME COMPUTER SYSTEMS
SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC.
11460 N. CAVE CREEK RD.
PHOENIX, ARIZONA 85020
(602) 997-0997
ASK FOR DON

The Bulletin Board
makes selling
your
equipment easy!

DATA GENERAL

Desktops
MV/2000s IACs Disks, CRTs, Memory Boards.
D214 $595 D411 $895
D215 $670 D461 $1,120
XT Clone With D208 Emulator $695.
Have Your XT & Emulate Too!
Amos Sonoma, Inc.
(301) 238-8100

MV20000 32Mb Sys Call
MV10000 16Mb Sys Call
MV8000 8Mb Sys Call
8990 MV20000 16Mb Mem $26,000
8990-A MV10000 16Mb Mem $26,000
8689 MV4/MV10 2Mb Mem $3,900
8670 MV4/MV10 4Mb Mem $8,900
8671 MV4/MV10 8Mb Mem $11,900
8782 Exp. Chas. MV4/8/10 $5,800
Intl. Computing (612) 938-8112

MISC.

NEW & USED
RAISED FLOORING
Immediate Delivery
Quality Installation
RAISED COMPUTER FLOORS
One Charles Street
Westwood, NJ 07675
(201) 666-8200
Telex #13-5028

ORDER FORM
COMPUTERWORLD BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. Computerworld comes out every Monday. The Bulletin Board is only for the buying and selling of computer equipment.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Basic Four, Burroughs, Control Data, Disk Drives and Tapes, Amdahl Prime Modems, Perkin Elmer, Printers, TI, Tapes, Wang, Gentel, Desk Top Computers, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be clearly typewritten. Ads must be given over the phone to our team of ad takers, or sent in writing, no camera ready material will be accepted. The standard size is 1 column by 1 inch deep. These units may be combined to form larger size ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $178.00 (One unit minimum and no fractional units allowed.) There are no agency commisions or quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Date(s): _____
Classification: _____
Name: _____
Company: _____
Address: _____
_____
Telephone: _____

Send this form to:
COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171
617-879-0700 800-343-6474

THE BULLETIN BOARD

WANG

UP TO
$5,000. REWARD
LEADING TO PURCHASE OF
VS100-VS300
LOADED WITH PERIPHERALS
DCI
(404) 451-9448
ALSO REWARDS FOR VS15-65-85-90

HOLSON ASSOCIATES, INC.
Buy And Sell
Guaranteed
For Wang Maintenance
2470 Windy Hill Road, Suite 253
Marietta, GA 30067
Call Richard Holley or Carole Benson
(404) 980-1700

BUY - SELL
MVP/LVP • OIS • VS • PC •
SYSTEMS IN INVENTORY
VS-45 • OIS • VS-100
GENESIS
EQUIPMENT MARKETING CORP.
(602) 277-8230

BUY IN CANADA WHERE YOUR U.S. DOLLARS GO FURTHER
Systems and Peripherals
Buy and Sell World Wide
Norcomex, Ltd
416-738-9883 or 416-736-1069
Telex # 06983391 TOR
FAX 416-736-9013

DEC

DECMATE II	$1,695.
LQP02	$1,395.

Digital
Computer Resale
(713) 445-0082

BUY • SELL • LEASE
DEC
VAX PDP11
New • Used
DCI
(404) 451-9448

For Sale By Owner
NEW PDP 11/73
At More Than 35% Off List
1 MEG Memory, 71 MEG Drive
(2) VT220 (1) VT100
List Price New-$21,000.
Will Sell-$12,500 or best offer
Contact Mr. Cook (603) 465-3535

MICROVAX II
BA123, 6 MB, 16 Ports
(3) RD53, TK50, LA100-BA
16-User License, Software
AVAILABLE NOW
FOR LEASE
Tim (617) 267-2900

VAX 11/780
Incl. Massbus Adaptor, Floating Point Accelerator, 4MB Memory, 20A/B TU-58 Isolation Transformer, DECWriter II Console, DP02 Modem, RM03 Disk Drive, Battery Backup, Massbus Expansion Cabinet, VAX/VMS License, DEC Maintained – $50,000
MCB Technology, Inc.(800) 984-0671

BUY • SELL • TRADE
Planning to buy non-DEC memory?
Check our DEC memory prices first!

DHU11-AP	MS11-PB
M7112-A	MS86-CA
LA120-RA	MS630-CA
MRV11-D	MS750-CA
	MS780-JA
	MSV11-JC
	RL02-AK
	VT100-AA

NEW YORK COMPUTER EXCHANGE
(516)752-8666 (800)645-9109

Micro 11/73, TK50, RD 53, RQDX3, 1 MB, DHV, uRSTS — $17,000
Micro 11-23 + SV, RD 52, RX50, 512 KB, DZQ, uRSTS — 9,000
(2) VT-220's GreenB/W — Each 800
(2) LA-210 - NEW — Each 1,300
LA-50 Printer - NEW — 500
SYSTEMS ALTERNATIVES, INC.
(602) 299-0823

HONEYWELL

HONEYWELL SPECIALISTS
LEVEL 6 DPS 6 SERIES 16
The Recognized Leader
In Honeywell Minicomputer Sales And Support
* Complete Minicomputer Line - New and Used
* All Peripherals and Terminals
* Upgrades and Features
* Depot Repair Capability
* Honeywell Maintenance Guaranteed
* Immediate Delivery - Low Prices
617-393-6639
TWX 710-347-7574
Boudreau Computer Services
Since 1974
100 Bearfoot Rd.
Northboro, MA 01532

Call
to place
your ad
today
(800) 343-6474
(617) 879-0700

IBM

4361, 4381
All Models Available
Call Russ Schneider
800/426-4341
In CA 408/241-3677
Marketex Computer Corp.

BUY • SELL • SAVE $
IBM DISPLAYWRITERS
34'S, 36'S, 38'S
PERIPHERALS
LRK RESOURCES LIMITD INC
CALL LAURIE OR RICK
713-437-7379

S/36 S/38
Buy - Sell - Lease
We Pay Cash
for your used equipment
1-800-LEAS-PAK
In Texas: 1-800-722-7811
D/FW Metro: 267-2841

3180
3178, 3179,
3278, 3274
All Other IBM Units Available
Call Penny 800/426-4341
In CA 408/241-3677
Marketex Computer Corp.

Special
Immediately Available
IBM 5360B23
Lease *$22,500* Rent
(212) 279-4467 (800) 532-0892

BABY 36 or PC 36
Available Now
For short or long-term lease or sale
Call: Jim Nichols
(415) 791-7383

IBM Displaywriters
• All models available
• Satisfaction Guaranteed
Complete inventory available for quick delivery - parts, features and upgrades too.
1-800-227-1616
(In Minnesota: 612-922-1610)
PRESTIGE OFFICE SYSTEMS

TECMAR Q1C-80H
Best Selling Tape Back-Up System for IBM PC & Compatibles

Qty 1	Qty 2-5	Qty 6-10
$1,394	$1,356	$1,322

Timesharing Services, Inc.

National	(800) 222-3475
Florida	(800) 421-4135
Northeast	(800) 874-3475

For Sale
3179-100
50 Available
$1,200 Each
Call Jan Poe (205) 868-3857

FOR SALE/LEASE
3880-003's
3380-AA4's
& B04's
Bluebonnet Computer Co.
(512) 926-3900

$/34 . $/36 . $/38
Upgrades/Peripherals
Lowest Price
Call Collect (404) 475-7507
Datamarc Computer Sales
700 Branch Dr, Alpharetta, GA 30201

SALE/LEASE
S/38
Model 6G1
Peripherals Available
Call Ron Gibb (914) 238-9631
Computer Merchants Inc.

FOR SALE
3174-01L
with 32 ports and extra diskette drives.
$13,900
Call Jan Poe (205) 868-3857

SALE/LEASE
3287-2
3274/4300 Attachment
Variable Width Forms Tractor
Available Now
Call Bill Hagan (914) 328-9631
Computer Merchants Inc.

S/38 8LB
Available Now
with 3370-A11, 2-B11, 3262, 3411-3 or S/36 B25
with 3262
For short or long-term lease or sale
Call: Jon McCurdy
(415) 339-9500

9335's
30 Day Availability
Ocean Computers Inc.
Call Chuck Or Tom
1-800-331-9263
213-306-9343

Your Ad
Could Be Here
For
$178.00

AUCTIONS

AUCTION
By Order of U.S. Bankruptcy Court
DENELCOR INC.
Supercomputer Developer & Manufacturer
Wed. & Thurs. March 18 & 19 10AM
Inspection March 17th 9AM-3PM
20100 East 32nd Avenue Parkway
Denver, Colorado 80011
COMPUTERS - DEC 11/34 and Interdata 8/32. Chromatics CS2. Gantal model 40 and 6 Micom 2000. Daisy Logican D CAE workstation. Microvax based graphics system with digitizer, pen plotter & color copier. Zycad Logic Evaluator Modules
DISK DRIVES - CDC 9766, CDC 9775. Ampex 9300
PRINTERS - Centronics 352, Tec F10-40, LA34
TERMINALS - Tab 132-15, Freedom 100, Televideo 910, Televideo 925, ADM 5, ADM 3A
TAPE DRIVES - Pertec Dual Density
CARD READERS - Documentation
LOCAL AREA NETWORK - Interlan NTS10
RAMTEK GRAPHICS SYSTEM, CALCOMP 1675 PLOTTER, PDP 11 A2D-AI BOARDS, DISK PACKS, 300 AMP POWER SUPPLIES, $400,000 ECL 16K PARTS INVENTORY, $700,000 INVENTORY MISCELLANEOUS COMPUTER PARTS, TTL PARTS, CAPACITORS, RESISTORS, CONNECTORS, HARDWARE
R/C WIRE-WRAP MACHINES, FAIRCHILD ART TEST STATION, BOARD CLEANERS, WORK STATIONS, 60" FLIP-TOP PLATE MAKER, 30 TON AIR CONDITIONING UNITS, 225 KVA POWER DISTRIBUTION UNITS
OFFICE FURNITURE, MACHINES AND EQUIPMENT, DRAFTING TABLES, MACHINES AND EQUIPMENT, COPIERS, PLOTTERS, ETC.
Call Or Write For Free Brochure
Donald Freedberg & ASSOCIATES
INDUSTRIAL MACHINERY & EQUIPMENT
FREEDBERG ASSOCIATES
COMMERCIAL & INDUSTRIAL
REAL ESTATE
Auctioneers • Appraisers • Liquidators
(303) 758-1510
2734 S. Milwaukee St.
Denver, Colorado 80210

TIME & SERVICES



VAX TIME

PER CPU
RECORD
OR
• MOST MAJOR LANGUAGES
• PROGRAMMING AVAILABLE
• AVAILABLE NATIONWIDE
medcom
Ask for Cheryl at (714) 998-8941

Litton
Computer Services
FULL-SERVICE COMPUTING
• TIMESHARING
• BLOCK PROCESSING
• NATIONWIDE NETWORK
• MICRO/MAINFRAME LINK
• STRATEGIC PLANNING FORECASTING
LET US SHOW YOU HOW WE CAN REDUCE YOUR DATA PROCESSING COSTS
NEW YORK (212) 972-7888
CHICAGO (312) 763-0003
LOS ANGELES (818) 715-5300
WASHINGTON (703) 471-8200
OR FOR MORE INFORMATION WRITE OR CALL:
Litton Computer Services
1931 Michael Faraday Dr.
Reston, Virginia 22090
Attn: Michael Day
(703)471-8200

CONVERSION SPECIALISTS
AUTOMATED CONVERSIONS TAILORED TO YOUR NEEDS
DOS TO MVS
HONEYWELL TO IBM DOS OR MVS
OTHER LANGUAGE/SOFTWARE CONVERSIONS
CUSTOM PROGRAMMING

COBOL	DOS
RPG II	MVS
CICS	CMS

BELCASTRO COMPUTER SERVICES
120 MILLCREEK ROAD
NILES, OH 44446
(216) 652-1638

COMPUTING SERVICES

CPU 1	CPU 2
MVS/XA	VM/370
CICS	DOS/VSE
IMS	CICS
TSO	CMS

** IBM HARDWARE
** FULL TECHNICAL SUPPORT
** FOURTH GENERATION LANGUAGES
** NATIONWIDE ACCESS
** GUARANTEED RESPONSE AND AVAILABILITY
** FULL DISASTER RECOVERY BACKUP
** ON-SITE CUSTOMER AREA
** FULL SECURITY
** VOLUME AND TERM DISCOUNTS
For more information please contact
BURNS COMPUTING SERVICES, INC.
10 Gould Center
Rolling Meadows IL 60008
Midwestern Sales (312) 991-5300
Eastern Sales (212) 422-1181 • (312) 398-3600

COMPUTER TIMESHARING
• We broker computer time.
• All mainframes.
• Nationwide Service
• NEVER a charge to the Buyer
• Our fees paid by the Seller
Call Don Selden at
Computer Reserves, Inc.
(201) 666-6100

How to increase your power without paying the price.

Turn to Manufacturers Hanover Data Services Corporation for low-cost, state-of-the-art timesharing and Information Center services.

- Secure environment
- Software includes MVS SP, VM/SP, VM/XA, TSO, GDDM, CMS, and Presentation Graphics Equipment
- Processing done on IBM 3084 MX3 and IBM 4381 systems
- Accessible via many telecommunications methods
- Volume discounts
- For more information write

Bob Miano, Vice President & General Manager
Manufacturers Hanover Data Services Corporation
430 Gotham Parkway
Carlstadt, New Jersey 07072
Or call (201) 896-2021

MANUFACTURERS HANOVER

IBM is a trademark of International Business Machines Corporation
© 1987 Manufacturers Hanover



ARE YOU GETTING THE LATE-BREAKING NEWS TOO LATE?

Is there one person in your company who always seems to be on top of the latest computer trends, issues, products, and breakthroughs?

Chances are, it's the same person whose name is on top of your company's *Computerworld* routing slip. In fact, by the time the company copy gets to you, the hottest news in the computer community may already be lukewarm.

Now's your chance to get your own copy of *Computerworld* delivered to your desk for only 76¢ a week. That's $38.95 for 51 information-packed issues of the computer community's most influential newsweekly.

Computerworld brings you up to the minute news about the world of computers and computer technology. Authoritative news. Timely news. All the news. News you can put to work and use to your advantage.

And, if you subscribe now, we'll send you 12 issues of *Computerworld Focus* — absolutely free. Each issue takes an in-depth look at topics like Software, Connectivity, Communications. And more.

What's more, we offer you a Money-Back Guarantee. If you decide *Computerworld* is not for you, tell us. We'll refund your money on all unmailed issues.

Call toll free **1-800-544-3712** (in Pennsylvania, call collect 215-768-0388) to get your weekly copy of *Computerworld* delivered to your desk for only 76¢ a week. Be sure to act now, before it's too late.



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

SALES OFFICES

Publisher/President/Lee Vidmar

VP/Sales/Edward P. Marecki, COMPUTERWORLD, 375 Cochituate Road Box 9171, Framingham, MA 01701-9171, (617) 979-0700

BOSTON SALES OFFICE Northern Regional Manager/Michael F. Kelleher, District Managers/David Peterson, Bill Cadigan, Sherry Driscoll. Account Manager/John Watts, Sales Assistant/Alice Longley, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 979-0700

CHICAGO SALES OFFICE Midwest Regional Manager/Russ Gerches, District Managers/Kevin McPherson, Larry Craven, Sales Assistant/Kathy Sullivant, COMPUTERWORLD, 2600 South River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433

NEW YORK SALES OFFICE Eastern Regional Director/Michael J. Masters, Senior District Manager/Doug Cheney, District Managers/Fred La Sapio, Frank Genovese, Account Managers/Jennifer Lindsey, Paula Smith, Sales Assistants/Mary Tagliareni, Sue Larson, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES SALES OFFICE Western Regional Director/William J. Healey, District Manager/Carolyn Knox, COMPUTERWORLD, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO SALES OFFICE Western Regional Director/William J. Healey, Senior District Manager/Barry Millone, District Managers/Ernie Chamberlain, Mark V. Glasner, COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, CA 94133 (415) 421-7330

ATLANTA SALES OFFICE Eastern Regional Director/Michael J. Masters, District Manager/Jeffrey Melnick, Sales Assistant/Melissa Christie, COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS SALES OFFICE Western Regional Director/William J. Healey, District Manager/Mark V. Glasner, COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, CA 94133 (214) 961-8366

WASHINGTON D.C. SALES OFFICE Eastern Regional Director/Michael J. Masters, District Manager/Bernie Hockswender, COMPUTERWORLD, 3022 Javier Road, #210, Fairfax, VA 22031 (703) 280-2027

PRODUCT CLASSIFIED ADVERTISING Product Classified Advertising/Account Manager Peter Slinguff, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING National Recruitment Sales Director/John Corrigan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES

New England Recruitment Manager/Al DeMille
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 979-0700

New York Recruitment Manager/Mary Ellen Hessler
Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest Recruitment Manager/Kevin Johnson
2600 S. River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433

Western Recruitment Manager/Barbara Murphy
18004 Skypark Circle, Suite 100, Irvine, CA 92714 (714) 250-1350

RECRUITMENT TELEMARKETING ACCOUNT EXECUTIVES

New England: New York/Jay Novack, Mid-Atlantic/Pauline Smith, Midwest/Ellen Casey Western/Nancy Percival, Toll Free. 1-800-343-6474 or (617) 879-0700

FOREIGN EDITORIAL/SALES OFFICES

Argentina: Ruben Argento, CW Communications S/A, Av. Belgrano 406 Piso 9 CP 1092 Buenos Aires. Phone: (011) 64 134 5583 Telex (390) 22644 (BAZAN AR).

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 72827 (COMWOR HX)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street Crows Nest, NSW 2065. Phone: (011) 91 2 4395133 Telex (790) AA74752 (COMWOR)

Austria: Manfred Weiss, CW Publikationen Verlagsgesellschaft m b H., Josefstadter Strasse 74, A 1080 Wien, Austria. Phone: (011) 43 222486 5910. Telex: (847) 115 542 (SCH/A)

Brazil: Key Imvel, Computerworld do Brazil, Rua Alcindo Guanabara, 25-11 andar, 20.031 Rio de Janeiro, RJ Brazil. Phone: (011) 55 21 240 8225 Telex: (391) 21 30838

Denmark: Preben Engell, Computerworld Denmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 695 Telex: (855) 31566.

France: Jean-Louis Rendon, Computerworld Communications S.A., 185 Avenue Charles 04 Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex: (842) 613234 F

Hungary: Dezso Futasz, Computerworld Informatika Co., Ltd., H 1536 Budapest, Pf. 385, Hungary. Phone: (011) 36 1 228 458. Telex: (861) 22 6307 (KSHP H).

Italy: Dr. Bruno Fazzini, Computer Publishing Group S.R.L., Via Viola 7, 20127 Milano, Italy. Phone: (011) 39 02 2613432 Telex: (843) 335318.

Japan: Mr. Shuji Motoyoshi, Computerworld Japan, 7-4 Shiromi 1-Chome Chuo-ku, Tokyo 104. Phone: (011) 81 3 551 3882 Telex: (781) 252-4217 (Computerworld Japan only)

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone (011) 81 3 230-4117/4118. Telex: (781) J26860 (reps for all CWCI publications except Computerworld Japan)

Mexico: Harvey Morales, Computer Mexico S.A. de C.V., Oaxaca 21 2 Mexico City 7 D F Colonia Roma. 06700 Mexico. Phone: (905) 514-4218 or 6309 Telex: (383) 177 1300 (ACHAME)

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 64, 1071 GK Amsterdam, The Netherlands. Phone: (011) 31 20 646426. Telex: (844) 18242 (CWCOM NL)

New Zealand: Reg Birchfield, CW Communications Ltd., 13 Maidstone St., Grey Inn, Auckland 1, New Zealand. Phone: (011) 64 9 768 993 Fax: (011) 64 9 780 244

Norway: Morten Hansen, CW Norge A/S, Havneveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (011) 472 647725. Telex: (856) 76478 (CW NOR N).

People's Republic of China: Chen Minghuri, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 914 9174 Telex: (716) 22214 (CCW CN)

Spain: Francisco Zabala, Computerworld Espana, Rafael Calvo 18 4B, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014 Telex: (831) 47894 (CW E).

Sweden: Bengt Mamfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 8 87 91 80 Telex: (854) 14904 9 (NOVACW)

Switzerland: Gebhard Ostenwalder, CW Publikationen AG, Weinbergstrasse no. 15, Postfach 253, CH 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77 Telex: (845) 816 710

Taiwan: Leona Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578 Taipei, Taiwan, R.O.C. Phone: (011) 02 751 3636 Telex: (785) 14142 (ACE GROUP) (Representative for all CWCI publications)

London: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT United Kingdom. Phone: (011) 44 1 831 9252 Telex: (851) 262346

United Kingdom: Euan Rose, Beere Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone: (011) 09 26 512424 Telex: (851) 311951 (BEEHOB) (Representative for all CWCI publications)

Venezuela: Kalman von Varna Nagy, CW Communications, C.R.L. Torre Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 78 20

West Germany: Eckhard Utpadel, CW Publikationen Verlagsgesellschaft mbH, Bremstrasse 26/28, Postfach 40 0429, 8000 Munchen 40, West Germany. Phone: (011) 49 89 360860 Telex: (841) 5215350 (COMW D)

CW COMMUNICATIONS/INC.

Patrick J. McGovern
Board Chairman

Axel Leblois	Tom Casalegno	Lee Vidmar
Chief Executive Officer	**President/CWCI, Inc.**	**President**
CWCI, Inc.		**CWCI/Framingham**

Senior VP-Communication Services, Jack Edmonston
VP-Sales, Edward P. Marecki. **VP-Finance,** William P. Murphy

Computerworld Headquarters 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (617) 879-0700. Telex: 95-1153. FAX: (917) 875-8931

SALES Vice President/Display Sales, Edward P. Marecki. National Recruitment Sales Director, John Corrigan. Display Advertising Manager Carolyn Novack. Classified Operations Manager, Cynthia Deseny

MARKETING Director of Marketing, Bob Singer

COMMUNICATION SERVICES Senior Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen. Sales Promotion Director, Liz Johnson

PRODUCTION Production Director, Peter Holm. Senior Production Manager, Leigh Swearingen. Typesetting Manager, Carol Polack. Art Director Tom Monahan

CIRCULATION Circulation Director, Nancy L. Merrill.

MIS Corporate Director MIS, Jeff Cordero

ADVERTISERS INDEX

AGS	39
Amherst Information Systems	31
Applied Management	70
Artificial Intelligence	53
Atrium Info Group	38
AT&T	48-49,60-61
Bell Atlantic	65
Bl Moyle Associates	54
Business Recovery Systems	43
Canaan	30
CGI Systems	95
Chen & Associates	61
Cincom	47,64
Communication Networks '87	25
Computer Tech Group	25
Computer Corp. of America	5
Cullinet	56/S7
CW Circulation	90
CW Corporate	75
CW NASA	76-77
CW PC World	46
CWIMS Australia	74
CWIMS France	74
Data Design	96
Data General Corp.	26-27
Data South	14
Digital Equipment Corp	22-23
Flagstaff Engineering	60
Hewlett-Packard	36-37
Hughes Aircraft	55
Info Dimensions	20-21
Integral Systems	18
Interface Group	52,63
ITT Courier	32-33
Local Data	12
Lotus Development Corp.	68-69
Micom	10
Mike Murach	9
Mitrol	19
MSA	44-45
Multi-Tech Systems	35
National Advanced Systems	31
NEC	24,58-59
North Ridge Systems	15
Novell	50
On-Line Software	72-73
Oracle	11,29
Radio Shack	42
Realia Inc.	34
Relational Technology	40
SAS Institute	28,41
Scientific Computer	62
Syncsort	3
Telex	56
Teltech	43
3M File System Management	70-71
Tone Software	13
Uccel Corp.	54
VM Software	7
Wyse	66

This index is provided as an additional service. The publisher does not assume any liabilities for errors or omissions.

Publishing craze lures DEC entry

BY NINAMARY BUBA MAGINNIS
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. announced last week VAX Integrated Publishing (VIP) solutions, a group of applications that run on hardware from the Microsoft Corp. MS-DOS-based Vaxmate to the largest VAX systems.

The solutions include DEC hardware, software and communications with third-party products from Aldus Corp., Microtek Labs, Inc., Information Dimensions, Inc., Adobe Corp., Interleaf, Inc. and Datalogics, Inc.

"DEC more than anyone else has identified the real topology of what's going on in the publishing environment. These guys have addressed every point on the issue," said David H. Goodstein, president and chief executive officer of Interconsult, a Cambridge, Mass.-based consulting firm.

Work group system

The VIP Vaxmate solution is positioned as a work group electronic publishing system for improved quality of internally produced documents such as newsletters and reports. The Vaxmate system works with MS-Windows, MS-Chart, WPS-plus and Aldus Pagemaker desktop publishing software. Options include a desktop laser Adobe Scriptprinter and Microtek's Model MS-300A image scanner.

The Vaxmate allows users to access publishable information that exists on corporate data bases and share higher speed peripherals, such as the Printserver 40, the vendor said.

The Vaxstation Publishing Solution System is a Vaxstation 2000 system coupled with Interleaf's Technical Publishing Software. The Vaxstation system is designed as a diskless environment configured in a local-area Vaxcluster in which users share central storage and peripherals from a controlling boot node.

The VAX Departmental Publishing Solutions consists of any VAX system with publishing software that can be accessed from the DEC All-In-1 office menu. Information Dimension's Basis can also run with the system.

Dedicated solutions

DEC also offers dedicated VAX-based solutions to produce technical documentation for central production publishing departments in industries such as aerospace or defense. The systems include Datalogics publishing software that features a DX filter to accept text input from any DEC WPS-plus word processor. Datalogics software is available directly from the vendor.

In addition, DEC announced a low-cost LN03 laser printer, Scriptprinter. Scriptprinter's resident Postscript page description language prints publishing-quality pages with text, graphics and scanned images, the vendor said. It costs $6,295 and will be available in May.

The Vaxmate VIP Publishing System is priced at $6,670; the system including the Scriptprinter costs $12,190. Both systems are deliverable within 90 days, according to the vendor.

A six-station clustered Vaxstation Publishing Solution System costs $154,060 with a 90-day delivery. Technical Publishing Software is priced separately and is available directly from Interleaf.

VAX Departmental Publishing Solution prices start at $41,691 and are available now. Basis software is priced separately and can be purchased from Information Dimensions.

Data base

FROM PAGE 1

Inc. plans to announce a distributed version of its relational product, Supra, by year's end.

IBM is known to be working on products as a result of its R Star, or Starburst, research project, an outgrowth of the Project R relational data base team effort. Its recent announcement of the Distributed Data Management (DDM) system for the PC "is a harbinger of things to come," says Peter Levine, vice-president of the Gartner Group, Inc., in Stamford, Conn. IBM is likely to extend the reach of its SQL soon to non-370 machines, which would provide a common data access language across multiple operating systems the way PC DDM is supposed to allow a PC programmer to access files across System/36, 38 and 370 family hosts.

Although distributed data base products have existed for several years, most of them do not take advantage of relational technology or SQL, which are viewed as providing the most effective underlying technology for distributed data bases. The nonrelational products have been available since roughly 1982, "but they haven't gone anywhere," Levine says. "We're looking forward to the day when we can access data across divisional lines, and DB2 appears to be a product that will do it," says Joyce Bischoff, senior data base analyst of the multinational firm, ICI Americas, Inc., of Wilmington, Del.

This kind of user appetite is not likely to be satisfied anytime soon, according to IBM observers. Distributed data base products require an active data dictionary, and DB2 is still stuck in the nonactive, catalog stage. Although the catalog lists where data is located, it does not automatically incorporate additions or changes to the data base, and it is not integrated with DB2 applications, says Shaku Atre, president of Atre International in Rye, N.Y.

The two pioneers of distributed data base, Oracle and RTI offer data dictionaries with their SQL-based, relational DBMS, but in Oracle's case, each node on the SQLStar network has its own dictionary, with the network querying each site to find where data is located.

With Ingres/Star from RTI, the dictionary functions more as a central repository — sitting on one node — but it still falls short of the global dictionary that would be able to locate data anywhere on the network controlling related functions and updating local dictionaries.

"If you're going to solve 100% of the problem, you must have a global dictionary," says Nick C. Rini, president of Business Software Technology, Inc.

> "GOOD data base design is important for a centralized DBMS. It's even more important with distributed DBMS."
>
> STEPHEN A. FOX
> COMPUTER CORPORATION OF AMERICA

in Westboro, Mass., and former Cullinet vice-president for software development.

IBM, with its multiple hardware systems, is judged by many to face the greatest challenge in coming up with a global dictionary. Because of this, Atre says, DB2 is "three or four releases away" from offering full distributed DBMS capabilities. "I don't see how IBM can get a product out before late 1988," adds the Gartner Group's Levine.

Another obstacle is updating the data on related data bases. Although no insuperable technical obstacle exists, the update process must cope with the hazard that the system at one site will fail as other data bases are changed, leading to inconsistent data.

While both Oracle's SQLStar and Ingres/Star are advertised for their ability to read data at multiple sites, they get around the many technical requirements of multisite updating by executing one update at a time.

Stephen A. Fox, director of a project at CCA to develop an Ada relational data base management system, says the still unannounced product will be able to execute multisite updates through a locking technique that freezes access to the target records, checks to make certain each site is able to update and then issues a commit order and executes a final check.

Skeptics of distributed data bases say such extensive locking systems are likely to leave records frozen at multiple sites if one site fails until the down site can be re-established. Fox claims CCA has found a way to complete or cancel the update across a failed site.

Some of the technical problems are going to have to be minimized by the way distributed DBMS is implemented, Fox says. "Good data base design is important for a centralized DBMS. It's even more important with distributed DBMS," he adds.

He and other sources claim the chief aim of distributed data base designers should be to maximize processing at local sites and minimize the amount of time needed on the network reading remote data and updating it.

Each vendor sells a networking product that ties the DBMS to other DBMSs in the distributed system. ADR, Cincom and Information Builders, Inc. have announced support for IBM's LU6.2 peer-to-peer networking protocols, which are widely expected to be the basis for IBM's own distributed product.

In another realm, IBM has sown confusion by leaving in doubt how many product lines will be included in its distributed approach. Its DDM product for the personal computer allows a PC user to download data from other nodes, but PCs cannot make their data bases available to other systems. IBM 370s make their data bases available but cannot access other systems' data. As a result, only System/36s and 38s can function as full, distributed nodes, and Cincom is steering clear of DDM for now, says Vicky Duckworth, data communications product manager.

Cullinet, which plans to bring out a relational DBMS for the DEC VAX this fall, is going to follow it up with a similar DBMS for the IBM 9370 low-end mainframe. It expects to then start offering pieces of a global dictionary that will help distributed DBMSs span the two hardware worlds, says Vice-President for Marketing Jeff Papows.

In a similar vein, RTI is working on an IBM VM/CMS version of Ingres/Net, which would allow Ingres to run on the 9370 and one day tie into the popular version of Ingres on the VAX. Information Builders is aiming to provide a distributed version of its Focus fourth-generation language and DBMS that will be able to access a wide range of other DBMSs. But full capability will take years to implement, Information Builders President Gerald Cohen says.

Such use of distributed data bases on a large scale, however, is still several years off. Few customers are buying SQLStar for that purpose, says Oracle's Vice-President of Marketing Peter Tierney. "VAXes haven't been integrated into the glass house yet," he says.

Judge throws out shrink-wrap law

BY PEGGY WATT
CW STAFF

NEW ORLEANS — A federal district judge recently tossed out a Louisiana law that validated shrink-wrap software licenses, saying the legislation violated federal copyright law that lets users make back-up copies of programs.

Vault, Inc., located in Westlake Village, Calif., which develops copy-protection schemes, is expected to appeal the ruling.

Vault took the issue to court nearly two years ago in the first test of the law. Vault sued Quaid Software Ltd. of Toronto regarding Quaid's Copywrite program, which allows users to make backups of copy-protected software.

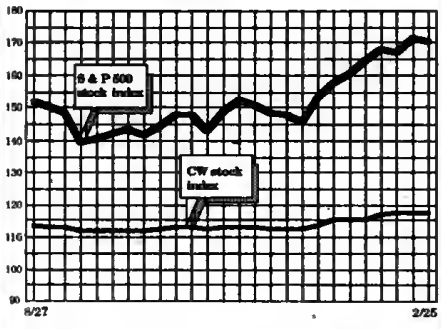
The statute, which was the first of its kind in the country, prohibited unauthorized duplication and distribution of software under the terms of the so-called shrink-wrap license contained in software packages.

Judge Frederick J. Heebe's ruling, issued nearly a year after testimony ended, cited a federal copyright statute that states a user may make archival backups if the property being copied is subject to mechanical or electrical failure, according to attorneys involved in the case.

Vault attorney Jarrell Godfrey contended the federal law should not apply to diskettes.

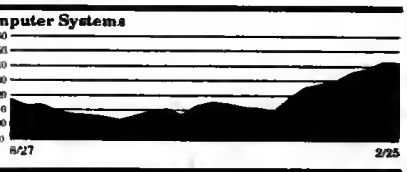
"We stuck a pencil through one diskette in court, stuck it in the computer, and it worked," he said. "We contend diskettes aren't subject to such damage and protected under that federal law."

STOCK TRADING INDEX

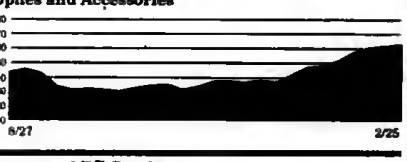


Indexes	*Last Week*	*This Week*
Computer Systems	142.5	142.2
Supplies & Accessories	161.7	163.0
Software & DP Services	132.2	131.5
Semiconductors	106.1	106.2
Peripherals & Subsystems	129.7	127.8
Leasing Companies	121.1	119.0
Composite Index	117.2	117.1
S&P 500 Index	170.7	169.8

Computer Systems



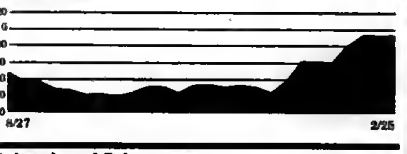
Supplies and Accessories



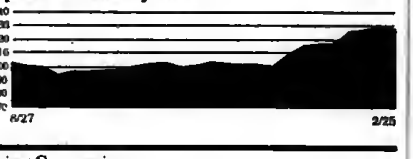
Software and DP Services



Semiconductors



Peripherals and Subsystems



Leasing Companies



CW CHARTS: LESLIE J. MILLER

Stock trading summary

CLOSING PRICES WEDNESDAY, FEBRUARY 25, 1987

Computer Systems

E X C H		52 WEEK RANGE (1)		CLOSE FEB 25 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8	4	4 75	+0.3	+5.6
O	ALTOS COMPUTER SYS	19	10	16 75	-0.4	-2.2
A	AMDAHL CORP	40	14	38.75	+0.0	+0.0
O	APOLLO COMPUTER INC	23	9	20 88	-0.6	-2.9
O	APPLE COMPUTER INC	TD	24	69 13	+5.6	+8.9
N	AT&T	38	22	23 25	-0.3	-1.1
O	C P T CORP	6	3	4 88	+0.6	+16.2
N	COMPAQ COMPUTER CORP	35	12	32 13	+0.3	+0.8
A	COMPUTER CONSOLES INC	12	6	9 75	-0.5	-4.6
O	CONCURRENT COMP CORP	24	11	14 50	-0.5	-3.3
N	CONTROL DATA CORP	31	20	29 75	-0.3	-0.8
O	CONVERGENT TECH	12	4	10 13	-0.5	-4.7
N	CRAY RESH INC	121	65	117 88	+0.4	+0.3
O	DAISY SYS CORP	15	6	11 63	-0.5	-4.1
N	DATA GEN CORP	45	25	35 38	-2.3	-6.0
N	DATAPOINT CORP	8	4	5 50	+0.4	+7.3
N	DIGITAL EQUIP CORP	158	76	155 00	+0.0	+0.0
N	FLOATING POINT SYS INC	46	11	15 38	+0.0	+0.0
N	GOULD INC	20	15	19 25	-0.8	-3.8
N	HARRIS CORP	40	27	37 38	-1.6	-4.2
N	HEWLETT PACKARD CO	60	38	54 13	-2.5	-4.6
N	HONEYWELL INC	84	58	80 63	-0.4	-0.5
N	IBM	162	118	141 75	+3.8	+2.7
O	IPL SYS INC	4	2	2 75	+0.3	+100
N	ITT CORP	64	43	62 13	-0.9	-1.4
N	M A I COM INC	19	12	14 63	+0.8	+5.4
N	MATSUSHITA ELEC INDL LTD	136	65	122 25	-4.6	-3.7
O	MENTOR GRAPHICS CORP	29	11	27 88	+0.1	+0.5
N	NBI INC	14	6	10 13	-0.5	-4.7
N	NCR CORP	65	40	84 50	+2.3	+3.6
N	PRIME COMPUTER INC	26	18	21 75	-0.6	-2.8
O	STRATUS COMPUTER	34	17	32 75	+0.0	+0.0
O	SYMBOLICS INC	15	4	4 13	-0.3	-5.7
O	TANDEM COMPUTERS INC	61	22	59 75	+0.8	+1.3
N	TANDY CORP	55	31	52 75	-0.6	-1.2
N	TEXAS INSTRS INC	163	103	158 38	-1.3	-0.8
A	ULTIMATE CORP	35	13	22 63	-0.5	-2.2
N	UNISYS	113	58	108 38	-3.0	-2.7
A	WANG LABS INC 6	22	11	15 00	-0.1	-0.6
A	WANG LABS INC C	22	11	14 75	-0.6	-4.8
N	XEROX CORP	75	49	73 75	+0.6	+0.9

Supplies & Accessories

E X C H		52 WEEK RANGE (1)		CLOSE FEB 25 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER BUSINESS PRODS	37	23	31.00	+0.3	+0.8
N	BARRY WRIGHT CORP	25	14	19 00	+0.1	+0.7
A	DUPLEX PRODS INC	23	16	21 00	+0.5	-2.4
N	ENNIS BUSINESS FORMS INC	34	22	31 88	0.6	2.3
N	3M CO	140	95	127 50	5.3	4.0
N	MOORE LTD	38	20	23 88	.10	-4.0
O	STANDARD REGISTER CO	50	32	48 25	+3.5	+7.8
N	WALLACE COMPUTER SVCS	50	37	47 25	+2.4	+5.3

Software & DP Services

E X C H		52 WEEK RANGE (1)		CLOSE FEB 25 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	4 00	-0.3	-5.9
N	ADVANCED SYS INC	21	12	19 38	-1.0	-4.9
N	AGS COMPUTERS INC	37	17	36 00	+0.6	-2.1
O	AMERICAN MGMT SYS INC	31	13	25 25	+0.5	+1.7
O	AMERICAN SOFTWARE INC	23	6	22 75	+0.0	+0.0
N	ANACOMP INC	7	3	6 25	+0.3	+4.2
O	ANALYSTS INTL CORP	11	4	10 25	-0.6	-5.7
O	ASHTON TATE	30	10	26 50	-0.5	-1.9
O	ASK COMPUTER SYS INC	17	8	16 75	-0.6	-3.7
O	ASTRODYNE COMP IND	3	1	1 84	-0.0	-1.7
N	AUTOMATIC DATA PROC	47	29	44 88	-0.5	-1.1
O	BOOLE & BABBAGE INC	11	4	9 00	-0.5	-5.3
N	COMPUTER ASSOC INTL INC	44	17	39 63	-0.3	-0.6
O	COMPUTER HORIZONS CORP	15	10	13 75	-0.4	-2.7
O	COMPUTER NETWORK TECH	10	4	4 75	-0.4	-8.4
N	COMPUTER SCIENCES CORP	54	30	49 75	-2.5	-4.8
O	COMPUTER TASK GROUP INC	19	11	15 63	-1.1	-6.7
O	COMPUTONE SYS INC	6	0	0 19	+0.0	+0.0
O	COMSHARE INC	16	10	13 00	-1.6	-11.6
N	CULLINET SOFTWARE INC	16	6	10 38	-0.3	-2.4
O	CYCARE SYS INC	17	7	9 25	+0.4	+4.2
O	DUQUESNE SYS INC	33	16	47 50	+2.0	+4.4
N	GENERAL ELEC CO	104	71	102 75	+0.4	+0.4
N	GENERAL MTRS CORP	90	24	97 25	+0.0	+0.0
O	HOGAN SYS INC	15	7	12 88	-0.8	-5.5
O	INFORMATION SCIENCES INC	4	1	1 25	-0.3	-25.0
O	INFOTRON SYS CORP	16	7	9 50	-0.3	-2.6
O	KEANE INC	16	5	9 00	+0.3	+2.9
N	LOGICON INC	38	22	26 00	-2.1	-7.6
O	LOTUS DEV CORP	25	6	23 50	-49.5	-67.8
O	MANAGEMENT SCI AMER	21	11	20 13	+0.5	+2.5
O	MCI COMM CORP	13	5	5 38	+0.1	+2.4
O	MICOM SYS INC	16	10	14 75	1.5	-9.2
O	MICRO PRO INTL CORP	5	2	4 88	+0.7	+16.4
O	MICROSOFT CORP	78	26	74 50	+2.8	+3.8
O	NATIONAL DATA CORP	27	16	24 88	-0.5	-2.0
O	ON LINE SOFTWARE INT	23	10	21 63	+3.1	+16.8
O	ORACLE SYS CORP	38	13	35 50	2.0	5.3
O	PANSOPHIC SYS INC	42	25	38 00	-1.8	-4.7
O	POLICY MGMT SYS CORP	30	15	29 00	+0.3	-0.6
O	PROGRAMMING & SYS INC	13	6	12 25	+3.3	+36.1
O	REYNOLDS & REYNOLDS CO	42	27	36 00	+0.8	-2.1
O	SCIENTIFIC COMPUTERS INC	6	4	7 75	-0.1	-1.6
O	SEI CORP	26	15	23 75	0.5	2.1
O	SHARED MED SYS CORP	53	20	37 38	-4.1	-9.8
O	SOFTWARE AG SYSTEMS INC	22	10	17 88	-1.9	-11.7
O	SOFTWARE PUBG CORP	15	5	14 63	+1.8	+13.6
A	STERLING SOFTWARE INC	21	10	13 38	+1.1	+9.2
N	SUNGUARD DATA SYSTEMS	20	10	19 50	-0.3	-1.3
N	UCCEL CORP	34	17	34 25	-0.5	-1.5
N	UNIS CORP	22	13	21 13	+1.1	+5.6
O	VM SOFTWARE INC	38	12	35 75	2.5	6.5

Semiconductors

E X C H		52 WEEK RANGE (1)		CLOSE FEB 25 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	34	13	21 50	1.6	7.0
N	ANALOG DEVICES INC	25	14	20 50	1.6	7.3
O	ANALOGIC CORP	14	10	11 38	0.6	5.2
N	APPLIED MAGNETICS CORP	25	13	23 38	0.4	1.6
O	AVANTEK INC	23	14	17 75	0.3	1.4
O	HADCO CORP	6	3	4 88	-0.4	-6.3
O	INTEL CORP	38	16	37 75	-0.8	-2.0
O	MICRO MASK INC	7	2	5 75	-0.6	-15.0
N	MOTOROLA INC	51	34	49 00	1.0	2.0
N	NATIONAL SEMICONDUCTOR	16	8	15 75	-0.4	-2.4
N	TERADYNE INC	30	16	22 75	0.5	2.2

E=EXCH: N = NEW YORK, A = AMERICAN, P = PACIFIC, B = BOSTON, L = NATIONAL, M = MIDWEST, O = OVER THE COUNTER, S = SPLIT

Q-T-C PRICES ARE BID PRICES AS OF 3P.M. OR LAST BID

(1) TO NEAREST DOLLAR

Peripherals & Subsystems

E X C H		52 WEEK RANGE (1)		CLOSE FEB 25 1987	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	8	9	8.00	+0.3	+2.6
A	ANDERSON JACOBSON INC	3	1	2 13	+0.0	+0.0
O	AST RESH INC	27	11	18 26	-0.5	-2.7
O	AUTOTROL CORP	10	5	6 50	-0.5	-5.6
O	AVANT GARDE COMPUTING	7	3	4 00	+0.0	+0.0
O	BANCTEC INC	13	6	11 38	+0.5	+4.6
N	BOLT BERANEK & NEWMAN	60	37	53 75	3.6	6.5
A	CETEC CORP	9	5	5 88	-0.1	-2.1
A	CGM TRONICS CORP	6	2	3 00	-0.1	-4.0
N	COMPUGRAPHIC CORP	27	16	22 25	+0.0	+0.0
N	COMPUTERVISION CORP	23	10	21 00	-0.6	-4.0
N	CONRAC CORP	16	12	17 50	+0.9	+5.3
A	DATAPRODUCTS CORP	16	11	14 12	-0.4	-2.6
A	DATARAM CORP	18	7	7 25	+0.0	+0.0
O	DATA SWITCH CORP	9	5	6 75	+0.0	+0.0
O	DATUM INC	7	4	6 25	+0.1	+2.0
N	DECISION INDS CORP	15	6	11 50	0.4	3.2
O	ENDATA INC	6	5	6 75	+0.0	+0.0
O	EMC CORP	34	11	26 75	3.3	10.2
O	EVANS & SUTHERLAND	37	20	34 00	2.3	6.2
N	FLOATING POINT SYS INC	46	11	15 38	+0.0	+0.0
O	GANDALF TECHNOLOGIES	9	9	8 63	+0.3	+2.0
N	GENERAL DATACOMM IND	15	6	11 00	-1.5	-12.0
N	MAZELTINE CORP	30	18	29 75	+0.0	+0.0
O	ICOT CORP	13	6	11 88	+1.4	+13.1
O	INFORMATION INTL INC	16	13	14 50	+0.3	+1.6
O	INTECOM INC	7	3	3 00	+0.0	+0.0
O	INTERLEAF INC	15	6	10 63	-0.8	-2.8
O	MEGADATA CORP	7	2	8 13	+0.1	+2.1
A	MSI DATA CORP	15	10	14 25	+0.4	+2.7
N	NASHUA CORP	29	16	27 38	1.0	3.5
O	NETWORK SYS CORP	16	10	17 13	1.2	6.8
N	NORTH AMERN PHILIPS CORP	48	35	41 75	2.0	4.8
N	NORTHERN TELECOM LTD	45	27	41 88	1.6	4.3
O	NOVELL INC	40	14	37 25	0.6	2.0
N	PARADYNE CORP	11	4	5 88	+0.3	+4.4
A	PENRIL CORP	9	4	4 63	1.3	-21.3
N	PLESSEY PLC	38	24	30 00	-3.6	-11.2
O	PRINTRONIX INC	15	10	11 50	1.1	8.8
O	QMS INC	16	10	10 13	+0.0	+0.0
O	RAMTEK CORP	7	3	4 88	-0.1	-2.5
N	RECOGNITION EQUIP INC	27	10	20 00	-0.5	-2.4
O	SCAN TRON CORP	19	11	11 50	+0.6	+5.7
N	SCIENTIFIC ATLANTA INC	15	8	15 25	+0.4	+2.5
O	SEAGATE TECHNOLOGY	42	8	37 13	2.1	5.4
N	STORAGE TECHNOLOGY	7	2	4 13	0.6	15.4
O	SUN MICROSYSTEMS INC	32	11	25 63	2.3	7.3
A	T BAR INC	6	5	7 88	-0.1	-1.6
A	TAB PRODS CO	18	12	17 88	+0.8	+1.4
O	TANDON CORP	6	2	3 50	-0.1	-3.4
A	TEC INC	7	3	3 75	+0.0	+0.0
N	TEKTRONIX INC	43	27	36 75	1.6	4.5
O	TELEVIDEO SYS INC	A	2	2 63	+0.0	+0.0
N	TELEX CORP	97	52	96 88	+8.1	+9.1
N	TIMEPLEX INC	36	14	34 88	+1.1	+3.3
N	TITAN CORP	12	6	7 50	-0.3	-3.2
O	VISUAL TECHNOLOGY INC	1	0	0 44	+0.0	+0.0
O	WYSE TECH	26	18	27 75	+0.3	+0.8

Leasing Companies

E X C H		52 WEEK RANGE (1)		CLOSE FEB 25 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	27	15	25 63	1.4	5.1
N	CONTINENTAL INFO SYS	14	7	12 25	0.8	5.8
O	FINALCO GROUP INC	5	2	2 88	-0.1	-4.2
O	PHOENIX AMERN INC	8	3	6 75	-0.0	-0.0
O	SELECTERM INC	12	5	5 75	-0.3	-4.5
N	U S LEASING	49	38	48 63	+0.0	+0.0

OTC stocks soar

Apple, Microsoft, Tandem achieve 52-week record highs

The national over-the-counter (OTC) composite index reached a record close of 422.93 last Thursday, and, appropriately, three of the index's most popular computer stocks achieved 52-week highs on the same day.

Technology companies make up 24% of the market listings, and the recent strengths of most OTC computer stocks have helped fuel the market surge.

Thursday's big three were Apple Computer, Inc., which achieved its high of 69¼ on Wednesday and remained unchanged Thursday; Microsoft Corp., which upped 2¾ to 77¼; and Tandem Computers, Inc., which rose ⅜ to 60⅛.

Joining this elite group with new highs on Thursday were Wyse Technology, up ¼ to 28, and Autodesk, Inc., which rose ¾ to 69¾.

Many other OTC computer issues are trading very close to their highs for the year.

Among them are On-Line Software International, which closed Thursday at 22½; Mentor Graphics Corp., 28⅝; Intel Corp., 38; Evans and Sutherland, 36; and ASK Computer Systems, Inc., at 17.

CLINTON WILDER

Apple brackets Unix, Ethernet

BY PATRICIA KEEFE
CW STAFF

LOS ANGELES — For the second time in little more than a month, Apple Computer, Inc. will highlight connectivity at a major product unveiling.

Along with the new Macintoshes (see story page 1), Apple will unveil both Ethernet and Unix networking products.

Unisoft Corp. has incorporated advanced connectivity features into the A/UX operating system, a Unix implementation developed for Apple by Unisoft.

A/UX features three connectivity modules: Appletalk for Unix; B-Net, Unisoft's implementation of Transmission Control Protocol/Internet Protocol (TCP/IP); and Unisoft NFS, which is licensed from Sun Microsystems, Inc.

Appletalk for Unix allows high-speed remote laser printing and facilitates the connectivity of network applications under Unix, as well as connectivity to other Appletalk networks.

B-Net provides network connectivity to more than 100 other TCP/IP-based Unix and non-Unix computers, Unisoft said.

Unisoft NFS allows transparent file access between itself and beterogeneous computer operating systems — such as Digital Equipment Corp. VMS, Microsoft Corp. MS-DOS, Unix System V and Version 4.2.

However, personal computers and the Macintosh on Appletalk cannot communicate with Appletalk for Unix. This is one area where Apple may choose to add value to A/UX.

Unisoft retains the right to relicense Appletalk for Unix to other manufacturers. This could provide other Unix vendors with an avenue into the Apple world.

Increasing its penetration into the DOS world, Apple will market the $899 Ethertalk card, developed by Ethernet vendor 3Com Corp. in Santa Clara, Calif., for the Macintosh II and SE.

Compatible with 3Com's 3+ software, Ethertalk allows users to exchange files and talk to IBM Personal Computers or Ethernet or Appleshare servers.

The new Macs will also gain indirect access to IBM mainframes as a result of 3Com's recently introduced internetworking capability (see story page 9).

Users of 3Com's 3+ software can internetwork 3Com Ethernet and either 3Com or IBM Token-Ring networks together. This means that Macintosh II or SE users linked to a 3Com Ethernet network can exchange packets with a token-ring network, sending and receiving data to and from an IBM mainframe in this manner, according to a 3Com source.

Mac ripens

FROM PAGE 1

available in the closed Macintosh system.

"Apple got a toe-hold into corporations last year with desktop publishing on the Mac and will continue to pry that door open with these products," said Norm DeWitt, hardware analyst for market research group Dataquest, Inc. in San Jose, Calif.

Expected to make their debuts are the $2,899 Macintosh SE, which has the familiar Mac chassis and Motorola, Inc. 68000-based microprocessor but which now includes a single Apple Desktop Bus (ADB) expansion slot; and the Motorola 68020-based Macintosh II, a three-piece system with six Nubus internal slots and color support.

The Macintosh II sells for $3,899, with a color monitor priced at $999 and a monochrome monitor priced at $399. Each system has a choice of keyboards — the standard Macintosh style for $129 or an extended keyboard with function keys for $229.

The Macintosh SE is scheduled to be available immediately, while Apple representatives said the Macintosh II will not ship until late summer.

Apple is positioning the Macintosh line as a medium to high-end, equivalently priced, alternative technology to the IBM PC, according to Jean-Louis Gassee, Apple's vice-president of product development.

Apple is also slated to offer some new options and add-ons that range from internal hard disk drives for each of the new models to video cards, tape back-up systems and controller cards that enable the new models to read MS-DOS format data. However, the new Macintoshes will not be able to run MS-DOS programs. The DOS adapter cards cost $129 for each model, and Apple reported that it will sell an IBM PC-compatible standard external 5¼-in. disk drive for $399.

More connectivity to that PC world is available with a $899 Apple Ethertalk card that reportedly will connect the Macintosh II to any Ethernet network.

Even the MS-DOS file compatibility will not convert heavily IBM shops to Macintosh, but it might eliminate some objections, said Tim Bajarin, executive vice-president of Creative Strategies Research International in San Jose, Calif.

"I don't expect corporate America to turn around and say, 'this is my machine,'" Bajarin said. "But the graphics workstation-based projects and desktop engineering will take a look at the Macintosh II, which will have a crack at some interesting niche markets."

Apple also has the chance to lobby hard while the MS-DOS market is splintered, with users still awaiting a new operating system and IBM dragging its feet about new PC models, commented John Sculley, Apple president and chief executive officer.

The Macintosh's ready availability and built-in system has brought increased interest from third-party developers. Apple said more than three dozen developers have software and accessories for the new Mac line.

The machines were a hot topic at last week's Personal Computer Forum, a conclave of PC industry executives held in Phoenix. "If I was doing a new product line, I would find a way to spend the money to implement it on both the Mac and the IBM PC and let the market decide," said Mitchell Kapor, former chairman of Lotus Development Corp.

Among the third-party products are add-on boards that accelerate performance and provide 80286 coprocessors, high-resolution monitors and applications software new to the Macintosh world. The following are new offerings:

- Radius, Inc. in Sunnyvale, Calif., developed the Full Page Display, a $1,995 15-in. high-resolution monitor that attaches to any model of the Macintosh line, and a 68020-based Performance Accelerator board for the Macintosh SE Plus and 512E.
- General Computer Co. in Cambridge, Mass., plans to come out with the the Hypercharger 020 for the Macintosh SE. This speed-up board reportedly will have a 16-MHz 68020 microprocessor used in the Macintosh II plus 1M byte of memory, upgradable to 4M bytes, and an optional math coprocessor, at a cost of $1,499.
- AST Research, Inc. in Irvine, Calif., has developed five expansion boards to enhance MS-DOS compatibility and speed.
- Dayna Communications in Salt Lake City plans to release the $595 Daynafile, an external smart disk drive that plugs into a Macintosh Plus, SE or II small computer systems interface port to read and write MS-DOS disks.
- Sigma Designs, Inc. in Fremont, Calif., developed 15- and 19-in. high-resolution monitors for the Macintosh line. The company's new Laserview display provides 1,664 dots by 1,200 lines and was previously available for MS-DOS systems.

INSIDE LINES

Plenty of cash to play with. A settlement appears to be imminent in the criminal case against Paradyne for allegedly defrauding the U.S. Social Security Administration in 1981. The trial, involving Paradyne and several of its executives, scheduled to begin today in Tampa, Fla., was removed from the trial calendar last week, according to Joe Magri of the U.S. Attorney's Office in Tampa. Paradyne has set aside an $8 million provision for future legal and/or settlement costs and has reiterated to securities analysts last week that it hopes for a pretrial settlement.

IBM holds the keys. According to software developers, IBM is showing beta versions of a low-end Intel 8086-based microcomputer, locked, locked and locked. The machine, aimed at the home and educational markets and, some say, set for an April announcement, is padlocked so developers can't see its inner workings.

Can we talk? Ontio Computer Products, which has developed a $29.95 Lotus 1-2-3 "work-alike," says it is ready to ship, except for one small problem. The firm is unsure whether Lotus intends to sue for copyright infringement. The small company, staffed by former Software Arts executives — the firm that brought us Visicalc — sent a letter more than two weeks ago to Lotus Chairman Jim Manzi, requesting word on whether the product, Ontio 259, is an infringement of Lotus's copyright. No word yet.

We've got good news and bad news. Eastman Kodak, scheduled to unveil optical storage products this week, confirmed that its electronic publishing units will lay off more than 100 employees, or 15% of their combined work forces, by March 13. The layoffs at the Atex and Eikonix subsidiaries stem from consolidating some Atex and Eikonix administrative and manufacturing functions and the refocusing of Atex on newspaper and magazine publishing markets.

To kill a VAX-killer . . . An analyst at Alex Brown & Sons speculates that DEC will release the next version of the Microvax as early as the third quarter of this year. Joseph Payne says the machine may use a new, low-power consumption CMOS chip with doubled performance. The performance of the MOS chip used in the VAX 8300/8200 could also be doubled. Those actions would put the Microvax through VAX 8300 lines in direct, intensified competition with the higher priced IBM 9370 line, Payne says.

Hail Mary! DEC is bringing in a queen to preside over its Decworld Exposition. The luxury cruise ship Queen Elizabeth II will moor at Boston's Commonwealth pier for the show's scheduled two-week run — from Sept. 8 to 18. DEC has decided to hold shows in the U.S. and Europe alternately and hold them for two weeks instead of one. Vertical industries will be invited to participate on particular days.

Let's get physical. Unisoft is involved in "preliminary discussions" with both IBM and Sun Microsystems to launch a project that would port the Network File System, Sun's file-sharing software, to the IBM VM operating system, according to Unisoft's Mark Belinsky, vice-president of marketing and sales. "There's better than a 50% chance that a project will be under way within three to four months," he says. Currently, NFS can be used with various versions of the Unix operating system.

Spreading out. Late last year, Lotus quietly acquired Future Software, a Salt Lake City, Utah-based mainframe spreadsheet software firm and producer of Future-Calc.

You think the action's on Dynasty and Dallas? After a prolonged shakeout and slump in the semiconductor industry, there are apparently a number of partnerships and acquisitions in the works. Sources say that LSI Logic is wooing GE's Intersil Division with an eye toward marriage but that money has been a sticking point. TI and Intel are said to be close to signing an agreement for an exchange of ASIC technologies. And Mostek hopes to make something of a comeback thanks to an agreement it apparently has with VLSI Technology, in which VLSI will license Mostek's ASIC technology.

BELIEF#1:

REALITY:

PACBASE

cgi

Watch what happens next time you ask a mainframe software vendor for a complete customer list.



You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

Why don't they want you to see a complete list? Simple. They know that their size and name familiarity do not guarantee happiness. Many "single source" or "all-things-to-all-people" vendors have, at best, uneven quality across a multi-application product line. They know that their customer list may contain a good number of less-than-happy clients. It's difficult for these vendors to commit the human and monetary resources necessary to produce the type of superior product available from a firm that specializes in a single application area. A firm like Data Design.

Data Design develops mainframe financial applications software. Period. We understand all our users' requirements and are therefore able to provide the necessary support: over 40 percent of our support and installation staff are CPA's or have MBA's.

Data Design doesn't balk at giving prospective customers a *complete* customer list. That's because hundreds of FORTUNE 1000 companies have reaped exceptional results from our financial software systems. Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more have opted for Data Design over other major vendors. Write for our complete customer list and ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions, and more.

You'll find that people who want financial software relief choose Data Design. Since 1973, nationally recognized independent software surveys have confirmed Data Design's unsurpassed record of user satisfaction—year after year. That's why we'll give you a complete customer list—and *they* won't.

So, if you're in the process of looking at mainframe financial software for your company, put Data Design on your list. Then tell the other vendors on it you're also looking at Data Design. And watch what happens.

Financial software by Data Design.
Simply the best.

GENERAL LEDGER
ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL
FIXED ASSETS
PROJECT ACCOUNTING SYSTEM

Learn more about the best financial software available, call Betty Fulton toll-free at 800-556-5511 today.

DATA DESIGN ASSOCIATES

Excellence in financial software. By design.

1279 Oakmead Parkway, Sunnyvale, CA 94086